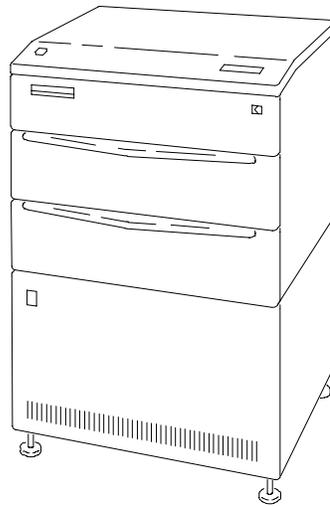


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10FEB97

**SERVICE MANUAL**  
**for the**  
***Kodak Ektascan 1120* LASER PRINTER**



H129\_0710AC



HEALTH IMAGING

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**PLEASE NOTE** The information contained herein is based on the experience and knowledge relating to the subject matter gained by Eastman Kodak Company prior to publication.

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This equipment includes parts and assemblies sensitive to damage from electrostatic discharge. Use caution to prevent damage during all service procedures.



**Important**

Use qualified personnel to service this equipment.



**Warning**

**DANGER - Infrared Laser Beam is not visible. Laser radiation when open, avoid direct exposure to infrared beam.** Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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# Section 1: Service Requirements

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# Safety

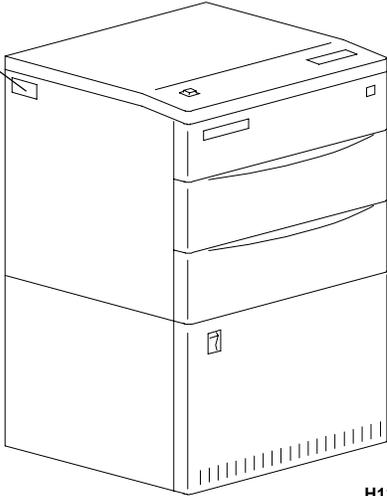
Use the following figures to locate the LASER SAFETY LABELS on the LASER PRINTER. For your safety, warnings are also included in the adjustment and removal procedures.



## Warning

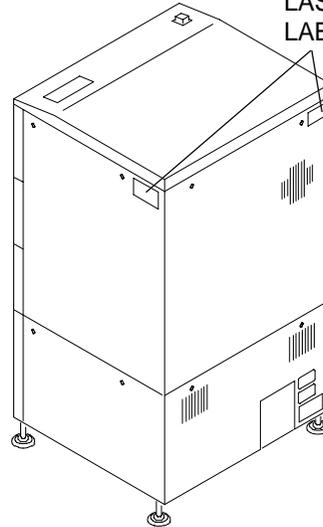
When doing a removal procedure, de-energize the LASER PRINTER.

LASER SAFETY LABEL



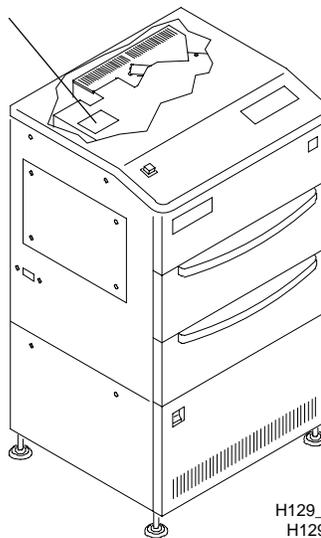
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H129\_0700AA

LASER SAFETY LABELS



H129\_0800ACA  
H129\_0800AC

LASER SAFETY LABEL



H129\_2901ACA  
H129\_2901AC

## Special Tools

**Table 1–1 Special Tools for the LASER PRINTER**

Part Number	Description
TL-3590	BNC TEE
*	<i>Epson</i> NB3 PORTABLE COMPUTER
*	<i>Epson</i> NB3 Power Adapter
TL-4219	RS-232 Cable (9-25DB)
TL-4238	RS-232 Null Modem Adapter
TL-4368	DENSITOMETER X331
TL-4371	Tool Kit, PORTABLE COMPUTER Compartment and Tools

\* To be supplied before training class.

**Table 1–2 Optical Cleaning**

Part Number	Description
P/N 263632	Air Brush
TL-1216	Lens Paper
Cat# 116-8277	Spectro•Grade Acetone (Lens/Mirror Cleaner)

**Table 1–3 Metric Tools**

Part Number	Description
TL-3450	Metric, Largest
TL-3523	Metric <i>Chapman</i> Set
TL-3789	Metric Hex Wrench (Ball) Set
TL-3833	Metric, (50 mm)
TL-3834	Metric, (77 mm)
TL-3835	Metric, (Larger)

Table 1-4 Miscellaneous Tools

Part Number	Description
TL-1171	Magnifier Loop
TL-2074	10X Probe
TL-2094	Red Test Lead, banana to mini•grabber
TL-2095	Black Test Lead, banana to mini•grabber
TL-2431	Air Flow Meter
TL-2579	IR Phosphor Probe
TL-2887	Replacement Tip for 10X Probes
TL-2963	IC Insertion/Extraction Tool
TL-3348	Oscilloscope
TL-3349	Anti•Static Bag 18X18
TL-3832	Anti•Static Spray
TL-3942	Touch•up Paint, Greige
TL-3972	Extender Board
TL-4360	Optical Power Meter
TL-4603	Protective Eyewear
TL-4586	Vacuum Gauge
TL-4587	Adapter for Vacuum Gauge
TL-4715	Pulse Cycle Test Tool
TL-4717	Memory Board Expansion Puller
*	Plastic Ruler, 6 inch
182590	Wire Tie, 4 inch
182915	Wire Tie, 6 inch

\* To be supplied in training class.

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## Covers

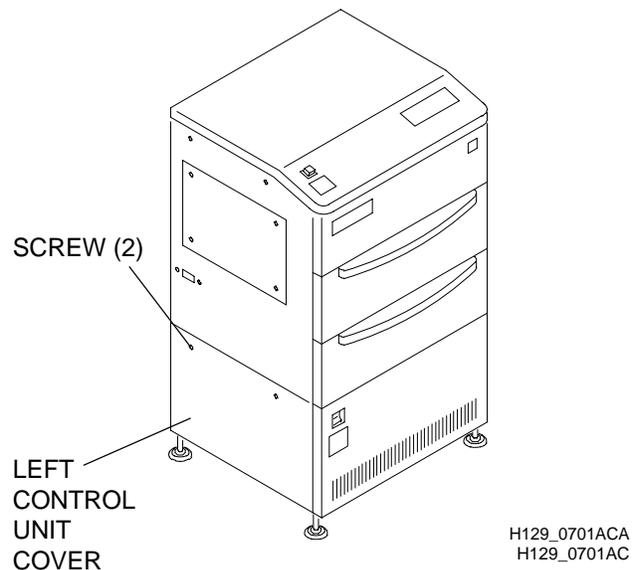
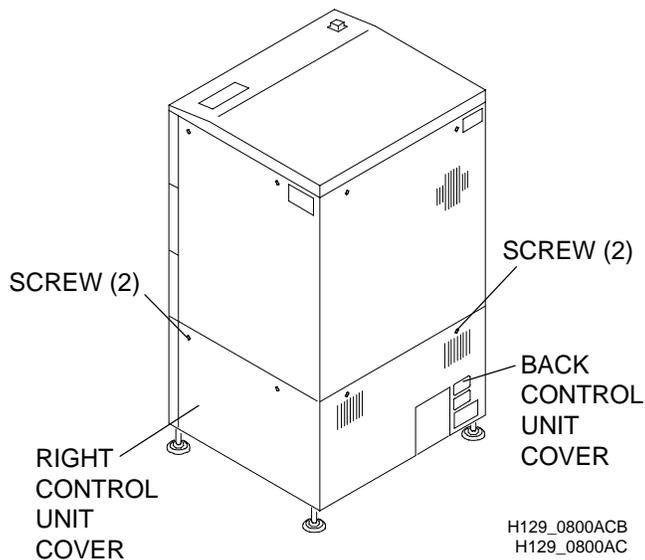
### Right, Left and Back Control Unit Covers



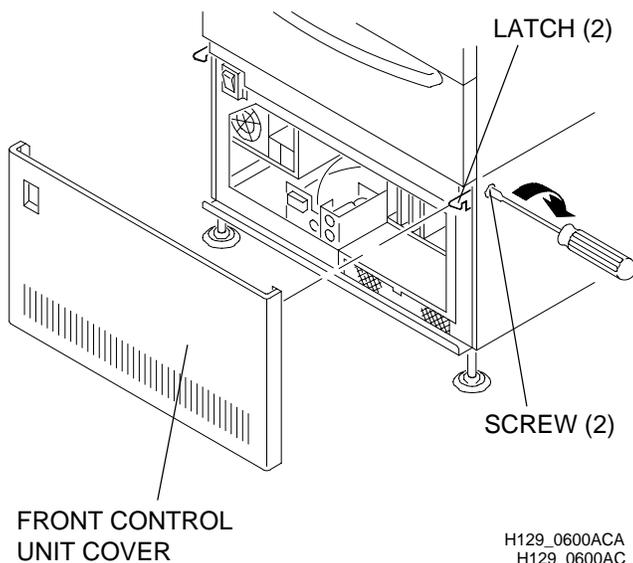
**Warning**

Dangerous Voltage.

- [1] De-energize the LASER PRINTER.
- [2] Loosen the 2 SCREWS for the COVER being removed by rotating each SCREW 90° counterclockwise.
- [3] Pull out on the top of the COVER and lift the bottom of the COVER to disengage it from the LASER PRINTER.
- [4] Remove the COVER.



### Front Control Unit Cover

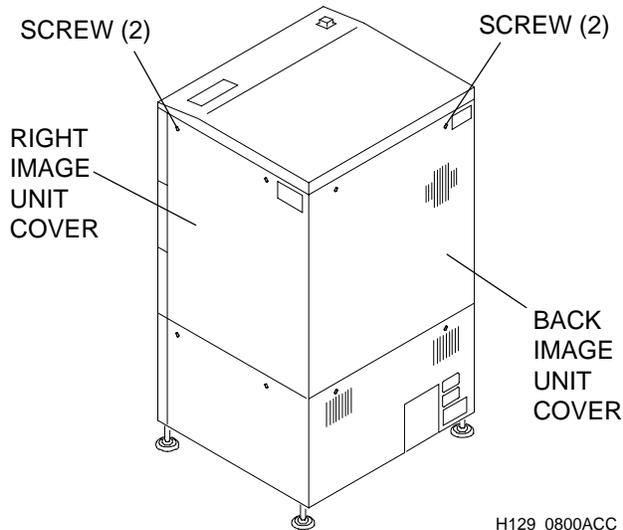


**Warning**

Dangerous Voltage.

- [1] De-energize the LASER PRINTER.
- [2] Rotate each of the 2 SCREWS 30°.
- [3] Disengage the FRONT CONTROL UNIT COVER from the LATCHES.
- [4] Lift up and remove the FRONT CONTROL UNIT COVER.

## Right and Back Image Unit Covers



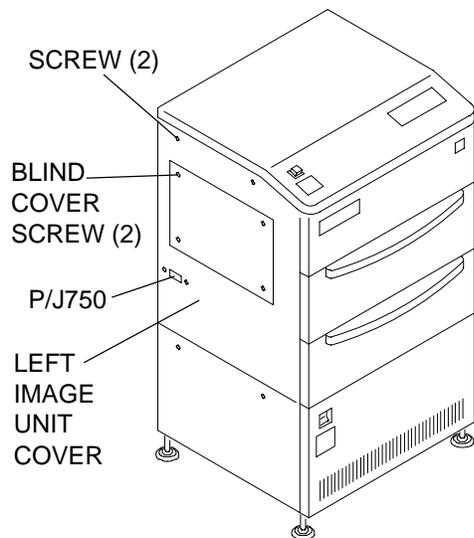
H129\_0800ACC  
H129\_0800AC

### Warning

Dangerous Voltage.

- [1] De-energize the LASER PRINTER.
- [2] Loosen the 2 SCREWS for the COVER being removed by rotating each SCREW 90° counterclockwise.
- [3] Lift the bottom of the COVER to disengage it from the LASER PRINTER.
- [4] Remove the COVER.

## Left Image Unit Cover



H129\_0701ACB  
H129\_0701AC

### Warning

Dangerous Voltage. Possible damage to eyes from invisible laser beam.

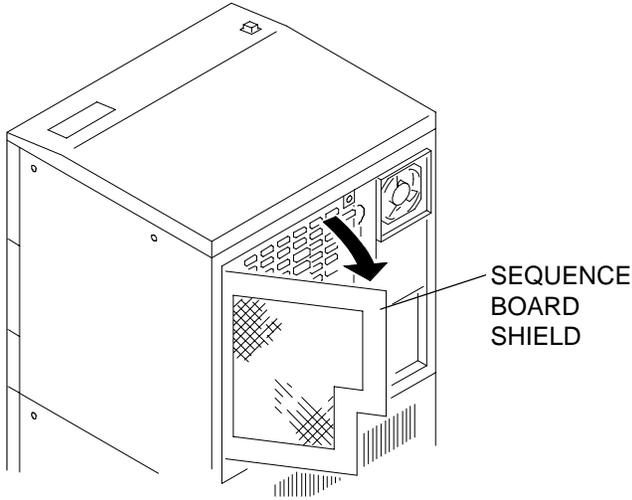
- [1] De-energize the LASER PRINTER.
- [2] Remove the 4 BLIND COVER SCREWS.
- [3] Disconnect the CONNECTOR J750.
- [4] Loosen the 2 SCREWS for the LEFT IMAGE UNIT COVER by rotating each SCREW 90° counterclockwise.

### Caution

Do not remove the LEFT IMAGE UNIT COVER until J750 has been disconnected.

- [5] Lift the bottom of the COVER to disengage it from the LASER PRINTER.
- [6] Remove the COVER.

## Sequence Board Shield



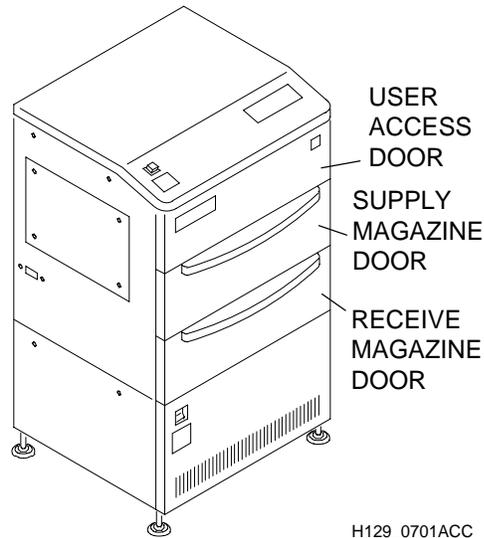
### Warning

Dangerous Voltage.

- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK IMAGE UNIT COVER.
- [3] Open the SEQUENCE BOARD SHIELD.

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H129\_0601AC

## Supply Magazine Door, Receive Magazine Door and User Access Door



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H129\_0701AC

## Top Cover



H129\_0701ACD  
H129\_0701AC

- [1] Open the RECEIVE MAGAZINE DOOR and the USER ACCESS DOOR.



### Warning

Dangerous Voltage. Possible damage to eyes from invisible laser beam.

- (a) Energize the LASER PRINTER.
- (b) Wait about 1 minute for the PRINTER to complete a system self-check.



### Note

If no magazines are present, proceed to Step (e).

- (c) Press the MAGAZINE DOOR OPEN/CLOSE SWITCH.
- (d) Wait until the LATCH SOLENOID releases.
- (e) Open the RECEIVE MAGAZINE DOOR.
- (f) Press down the USER ACCESS DOOR LATCH to open the USER ACCESS DOOR.

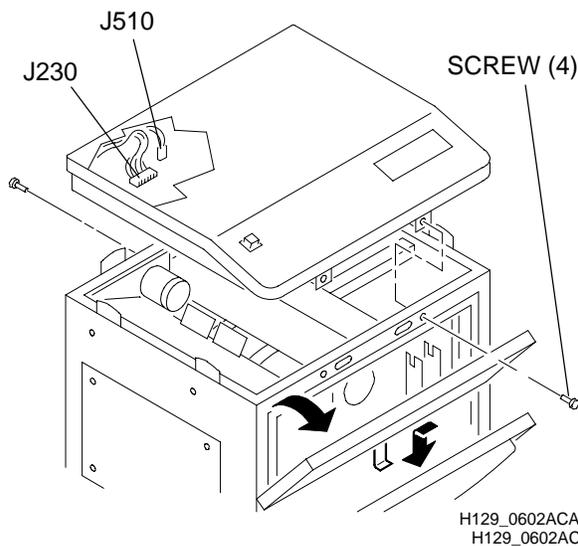
- [2] De-energize the LASER PRINTER.

- [3] Remove the BACK IMAGE UNIT COVER. If necessary, use the procedure on Page 2-3.

- [4] Remove the 2 SCREWS from the front of the TOP COVER and the 2 SCREWS from the back of the TOP COVER.

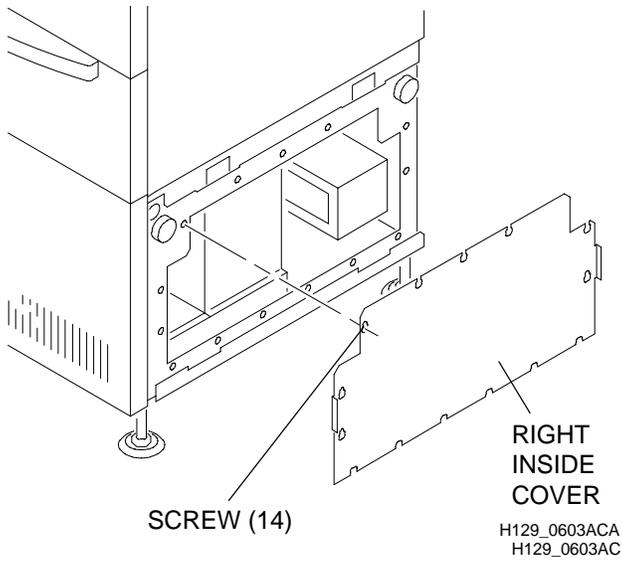
- [5] Disconnect J510 and J230.

- [6] Lift and remove the COVER.



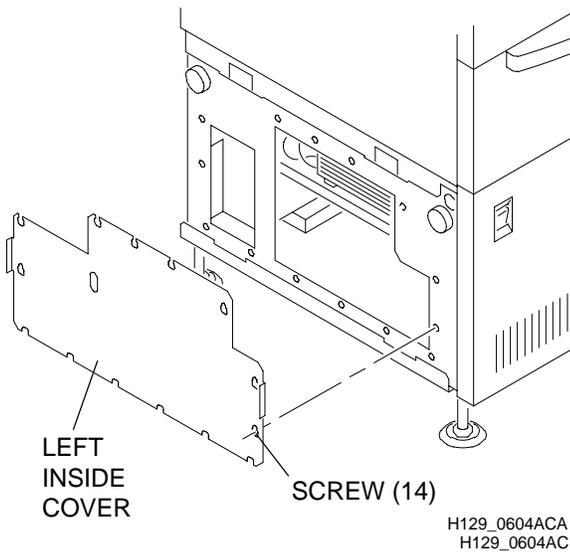
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H129\_0602AC

## Right Inside Cover



- [1] Remove the RIGHT CONTROL UNIT COVER.  
If necessary, see the procedure on Page 2-2.
- [2] Loosen the 14 SCREWS.
- [3] Lift and remove the RIGHT INSIDE COVER.

## Left Inside Cover



- [1] Remove the LEFT CONTROL UNIT COVER. If  
necessary, see the procedure on Page 2-2.
- [2] Loosen the 14 SCREWS.
- [3] Lift and remove the LEFT INSIDE COVER.

## Circuit Boards

### Memory Board/6MB or 20MB



#### Warning

Dangerous Voltage.



#### Note

This board is called the Memory Management Board in the Wiring Diagrams.

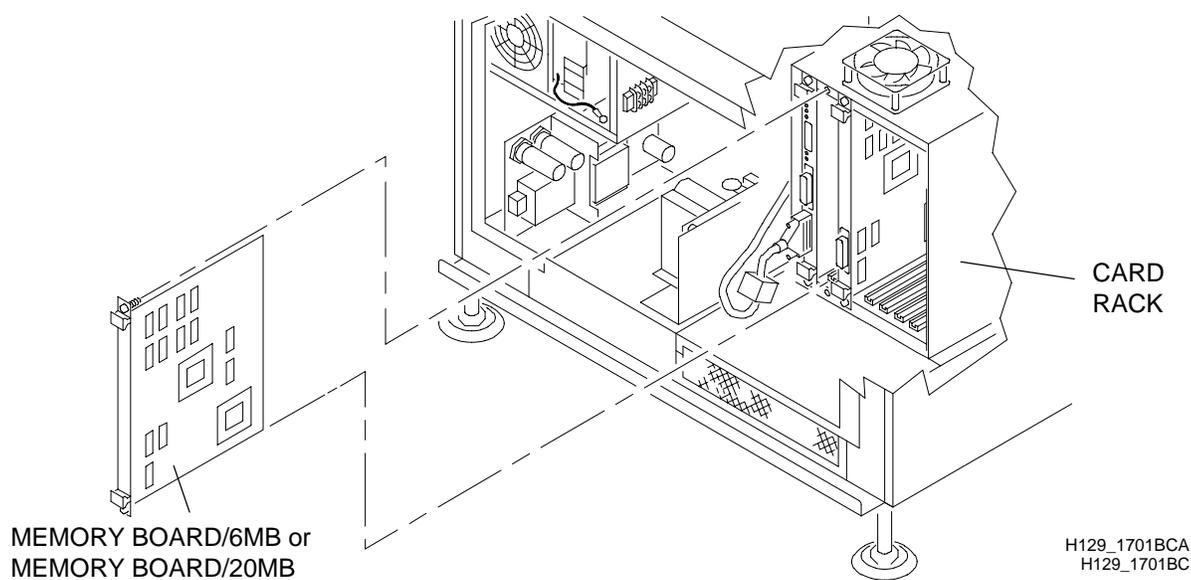
- [1] De-energize the LASER PRINTER.
- [2] Remove the FRONT CONTROL UNIT COVER. If necessary, see the procedure on Page 2-2.



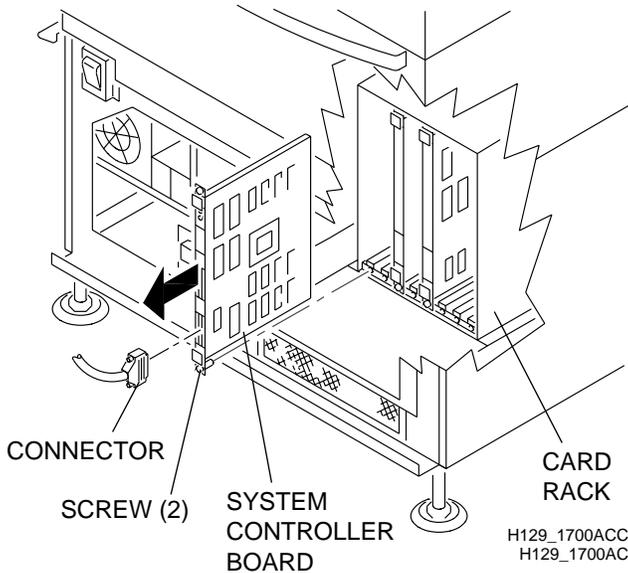
#### Caution

Possible damage from electrostatic discharge.

- [3] Loosen the 2 SCREWS of the *Kodak Ektascan 1120* MEMORY BOARD/6MB or 20MB located in SLOT 2.
- [4] Remove the MEMORY BOARD/6MB or 20MB by sliding it forward.



## System Controller Board



### **Warning**

Dangerous Voltage.

- [1] De-energize the LASER PRINTER.
- [2] Remove the FRONT CONTROL UNIT COVER.  
If necessary, see the procedure on Page 2-2.

### **Caution**

Possible damage from electrostatic discharge.

- [3] Disconnect the CONNECTOR from the SYSTEM CONTROLLER BOARD.
- [4] Loosen the 2 SCREWS.
- [5] Remove the SYSTEM CONTROLLER BOARD.

### **Note**

A white dot is silk-screened on the circuit board next to pin position 1 for each jumper.

## JUMPERS

- [6] Check that the following Jumpers have been installed:

- J1-1 to J1-2
- J2-1 to J2-2
- J3-3 to J3-4
- J4-3 to J4-4
- J5-1 to J5-2, J5-4 to J5-5, J5-7 to J5-8, J5-10 to J5-11
- J8-2 to J8-3
- J9-1 to J9-2
- J11-1 to J11-2
- J12-1 to J12-2
- J14-3 to J14-4
- J15-1 to J15-2, J15-3 to J15-4
- J16-1 to J16-2, J16-3 to J16-4, J16-5 to J16-6
- J17-1 to J17-2
- J18-1 to J18-3, J18-4 to J18-6, J18-5 to J18-7
- J19-3 to J19-5, J19-4 to J19-6
- J21-1 to J21-2

## Install EPROMS

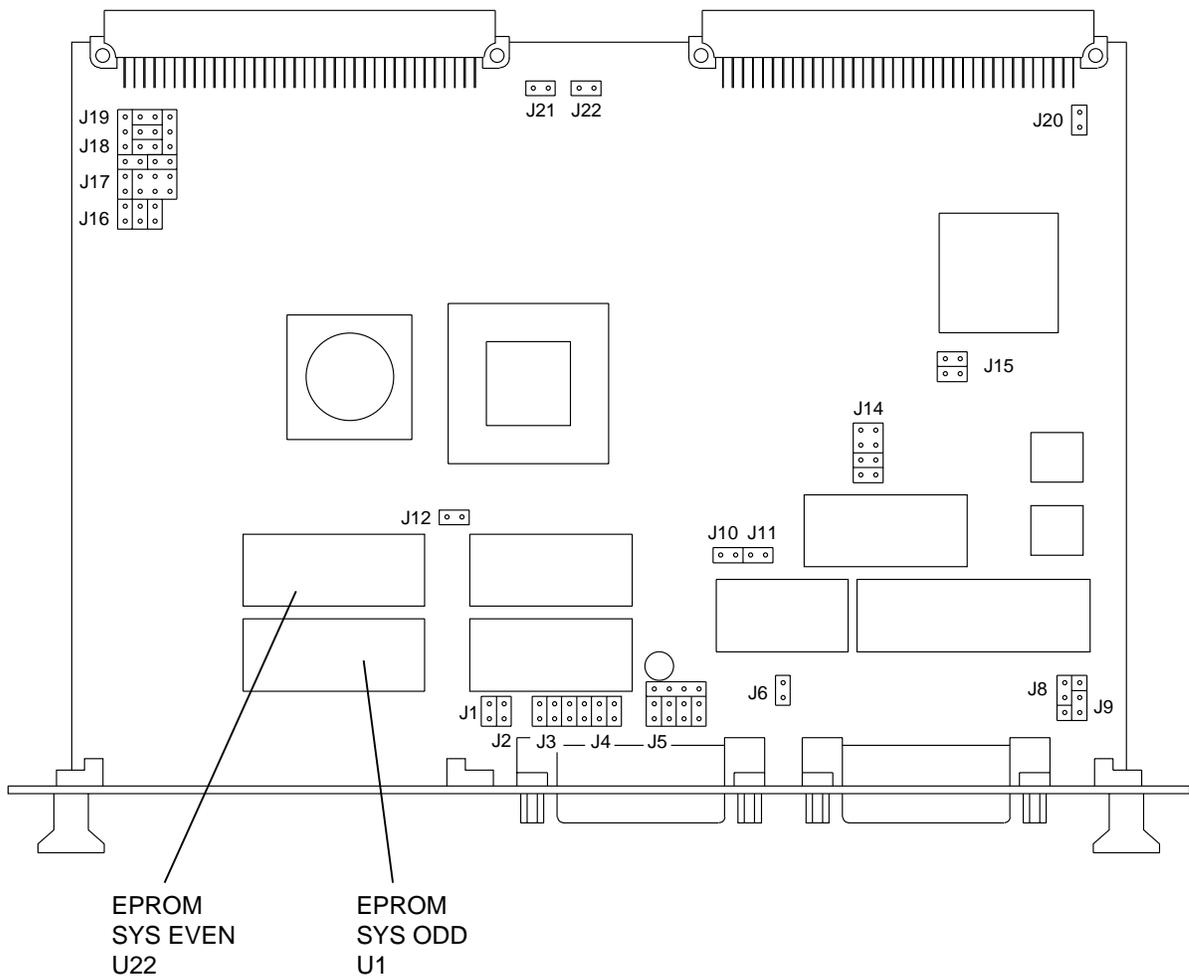


### Caution

Possible damage from electrostatic discharge. Use correct procedures and equipment to prevent damage.

- [1] Move the 2 EPROMS from the existing SYSTEM CONTROLLER BOARD to the new SYSTEM CONTROLLER BOARD.

## SYSTEM CONTROLLER BOARD



H129\_1712DCE  
H129\_1712DC

## Print Controller Board



### Warning

Dangerous Voltage.

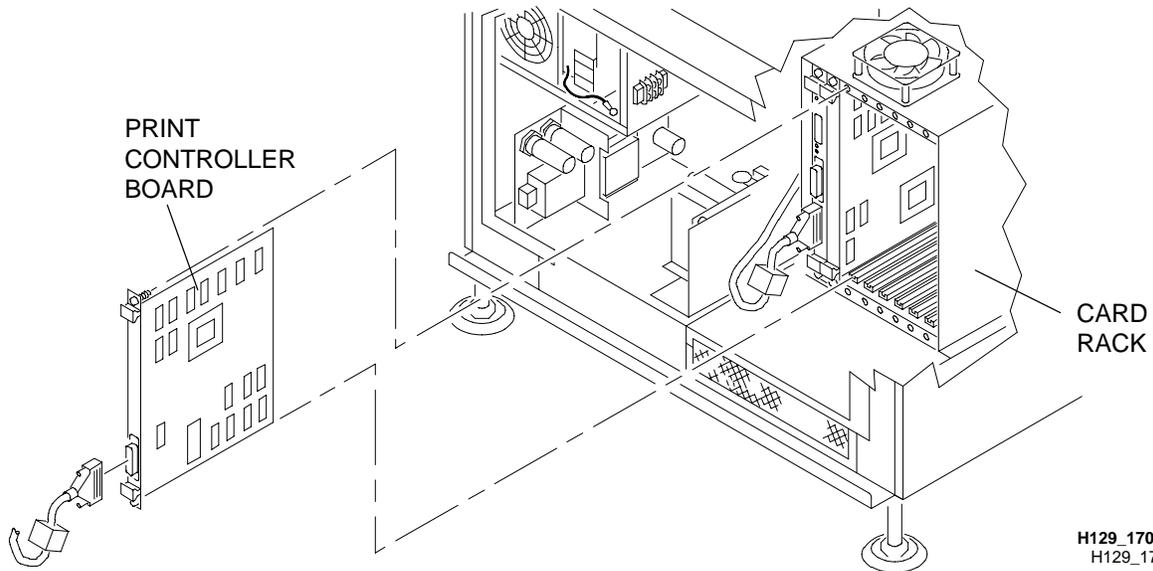
- [1] De-energize the LASER PRINTER.
- [2] Remove the FRONT CONTROL UNIT COVER. If necessary, see the procedure on Page 2-2.



### Caution

Possible damage from electrostatic discharge.

- [3] Disconnect the CONNECTOR from the PRINT CONTROLLER BOARD, located in SLOT 3 of the CARD RACK.
- [4] Remove the 2 SCREWS.
- [5] Remove the PRINT CONTROLLER BOARD by sliding it forward.



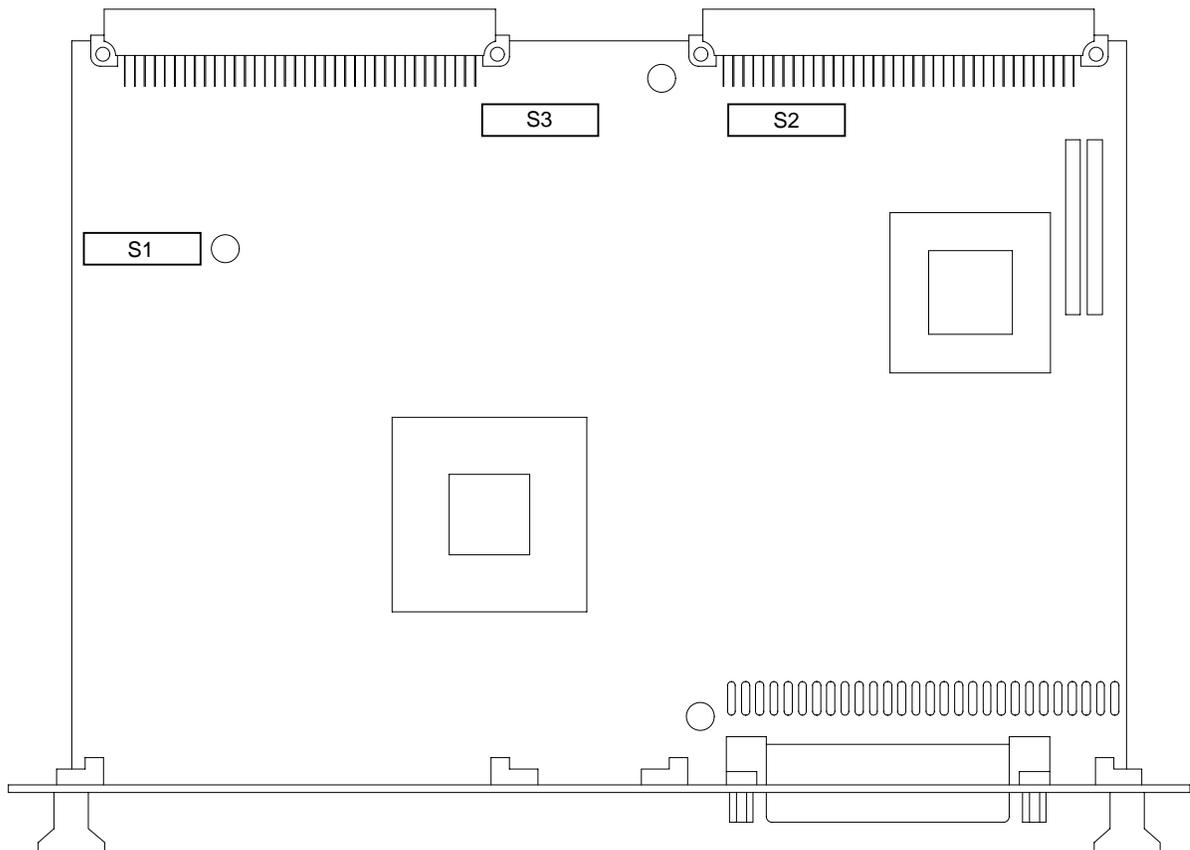
**SWITCHES**

[6] When installing a new PRINT CONTROLLER BOARD, check the following SWITCHES:

S1: Positions 1, 2, 3, 4, 6, and 8 are ON.

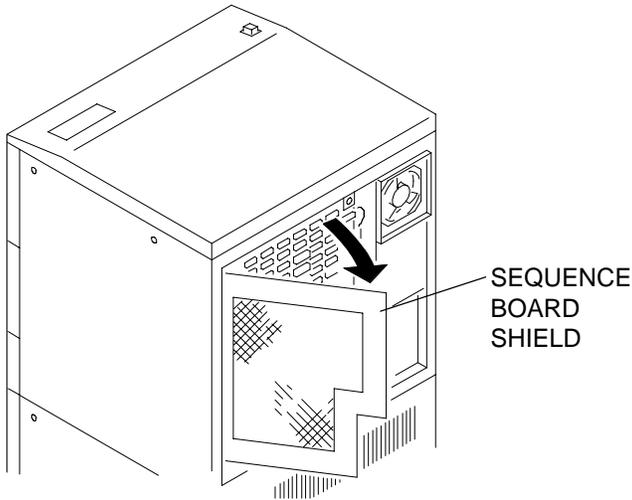
S2: Position 2 is ON.

S3: Position 7 is ON.

**PRINT CONTROLLER BOARD**

H129\_1713DC

## Driver Board

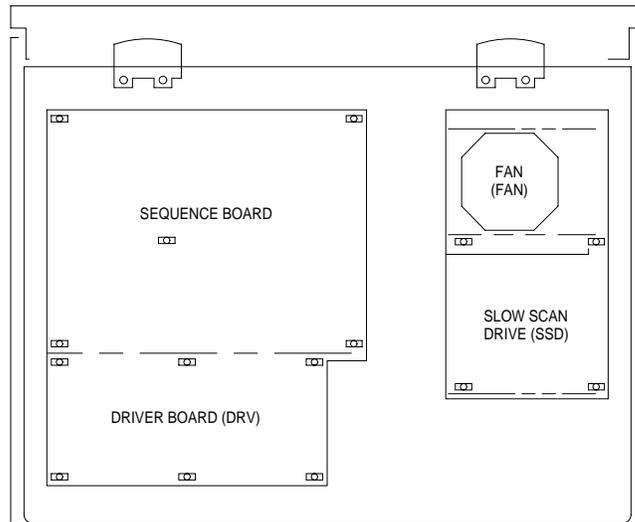


### **Warning**

Dangerous Voltage.

- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2-3.
- [3] Open the SEQUENCE BOARD SHIELD.

H129\_0601ACA  
H129\_0601AC



H129\_0802BC

## JUMPERS

- [4] When installing a new DRIVER BOARD, check that the following JUMPERS are installed in the normal position:

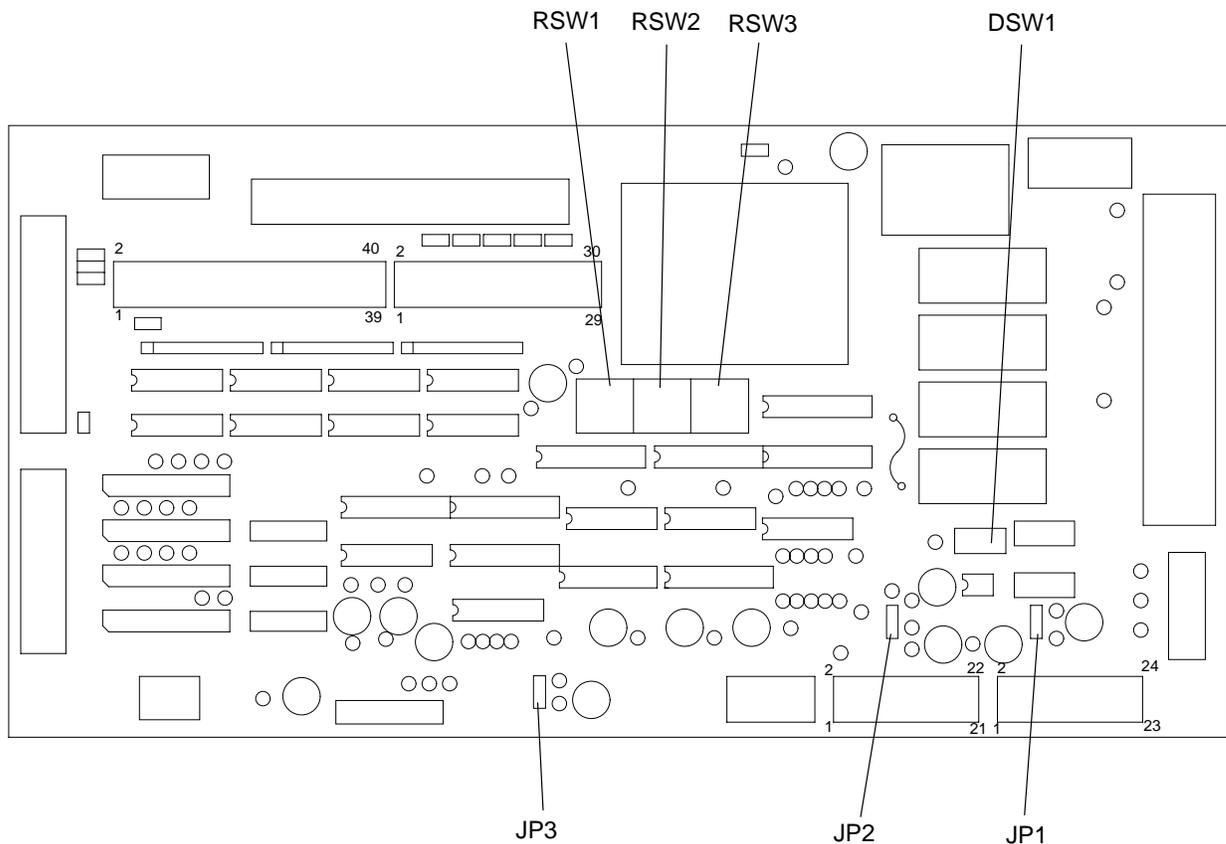
JP1  
JP2  
JP3

## SWITCHES

- [5] When installing a new DRIVER BOARD, check the following SWITCHES:

DSW1: Position 1 is ON  
RSW1: Position 8 is ON  
RSW2: Position 8 is ON  
RSW3: Position 8 is ON

## DRIVER BOARD



**The Replacement of a Driver Board with a Universal Driver Board**

When there is a need for a replacement for the DRIVER BOARD, install a UNIVERSAL DRIVER BOARD 696120.

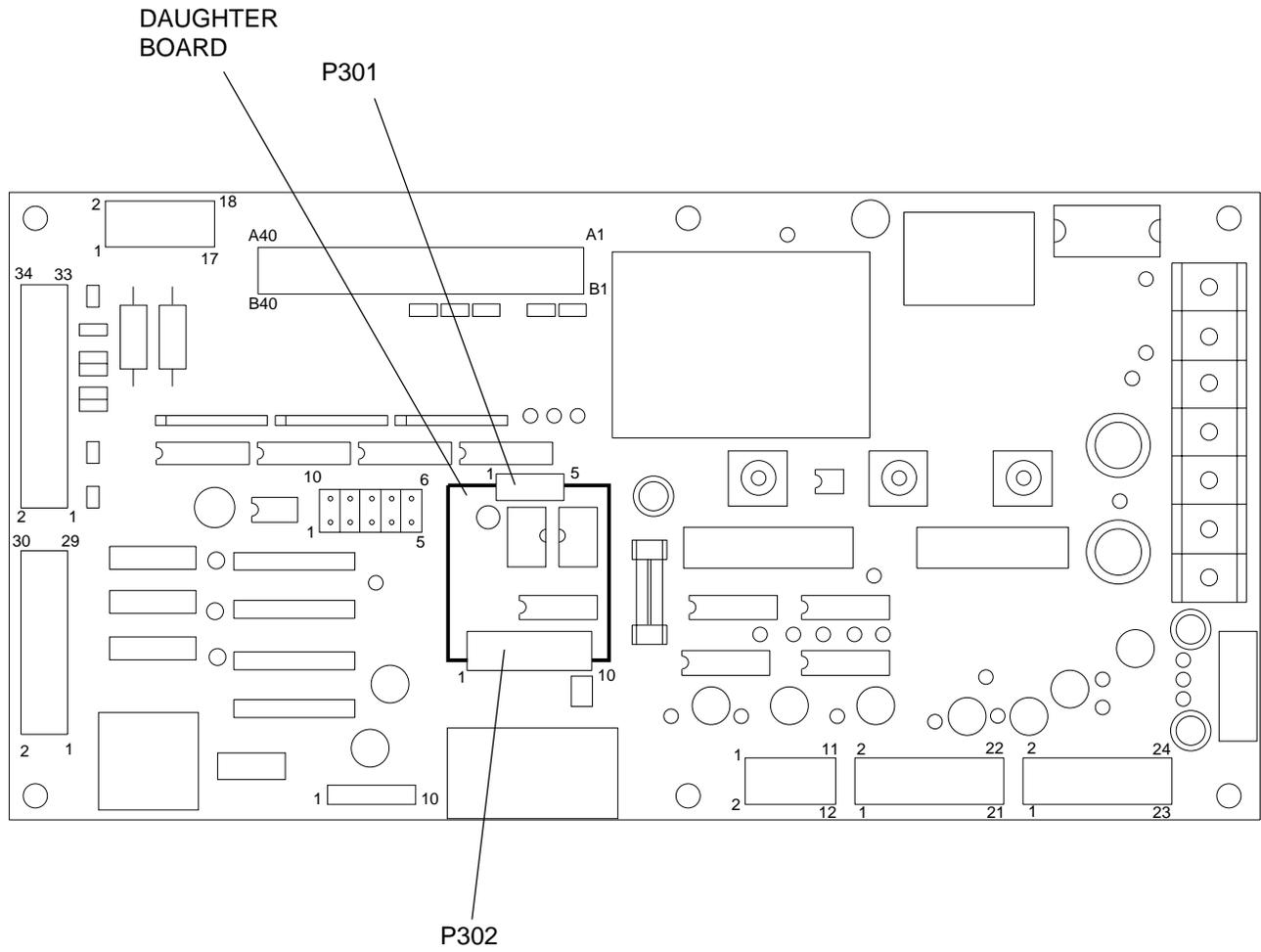
Use the following table and figures to check for the correct JUMPER positions on the UNIVERSAL DRIVER BOARD.

 **Note**

If the DAUGHTER BOARD is removed from the UNIVERSAL DRIVER BOARD, return the DAUGHTER BOARD to Part Services.

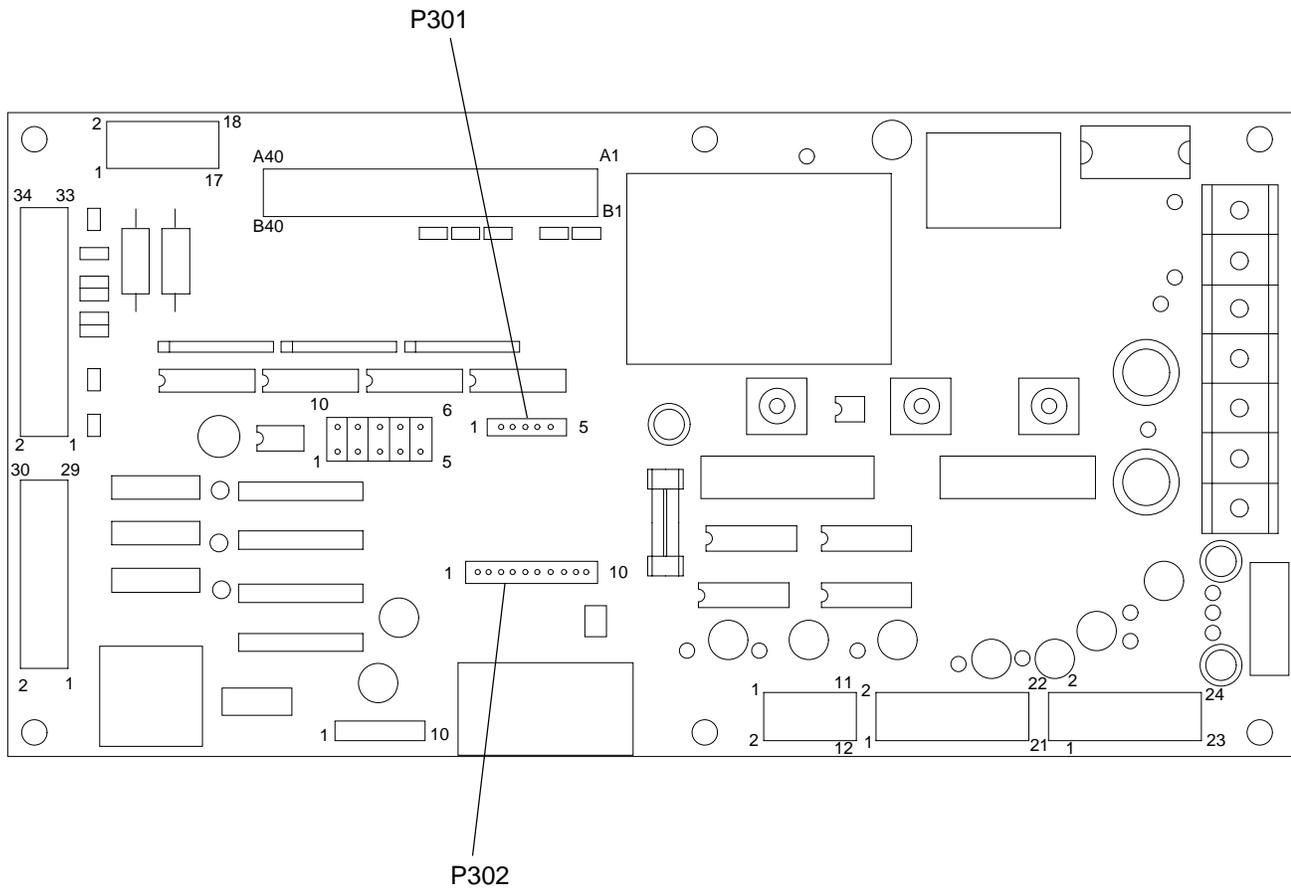
<b>Printer Serial Number</b>	<b>Daughter Board</b>	<b>Jumper Pin P302 Connection</b>
500025 - 500248	Used	No Jumper
500259 - 500480 600001 - 600003	Not Used	1 to 2 3 to 4 5 to 6
500481 and Up 600004 and Up	Not Used	No Jumper

UNIVERSAL DRIVER BOARD with DAUGHTER BOARD



H129\_1726DCC  
H129\_1726DC

UNIVERSAL DRIVER BOARD without DAUGHTER BOARD



H129\_1725DCA  
H129\_1725DC

## 2-Phase Pulse Motor Driver Boards (2PMD)

### Installation Notes

The LASER PRINTER has 2, 2-PHASE PULSE MOTOR DRIVER BOARDS (2PMD):

- the BEAM SPLITTER BOARD (2PMD-B)
- the SLIDE BASE MOTOR BOARD (2PMD-F)
- When replacing the BEAM SPLITTER BOARD, remove the HEAT SINK.
- When replacing the SLIDE BASE MOTOR BOARD, do not remove the HEAT SINK.

### Install JUMPERS

[1] Check that the following JUMPERS are installed:

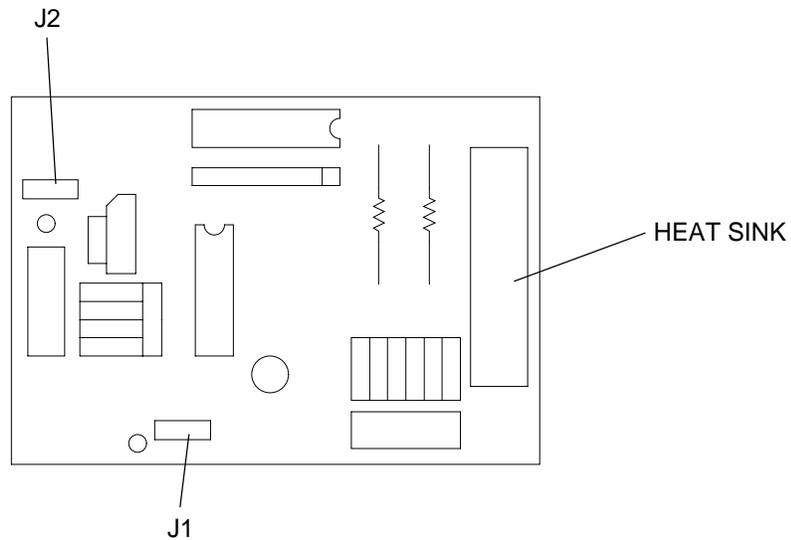
(a) BEAM SPLITTER BOARD

1. J1-1 to J1-2
2. J2-1 to J2-2

(b) SLIDE BASE MOTOR BOARD

1. J1-2 to J1-3
2. J2-1 to J2-2

### 2-PHASE PULSE MOTOR DRIVER BOARD (2PMD)



H129\_1704BCB  
H129\_1704BC

## 5-Phase Pulse Motor Driver Boards (5PMD)

The LASER PRINTER has 3, 5-PHASE PULSE MOTOR DRIVER BOARDS (5PMD):

- the TRANSPORT ROLLER MOTOR BOARD (5PMD-T)
- the RECEIVE ROLLER MOTOR BOARD (5PMD-R)
- the SUPPLY ROLLER MOTOR BOARD (5PMD-S)

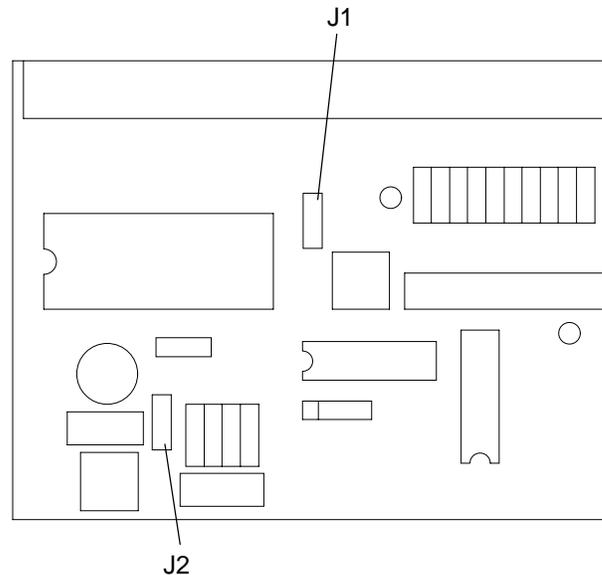
### Install JUMPERS

[1] Check that the following JUMPERS are installed for each of the boards being installed:

1. J1-2 to J1-3
2. J2-2 to J2-3

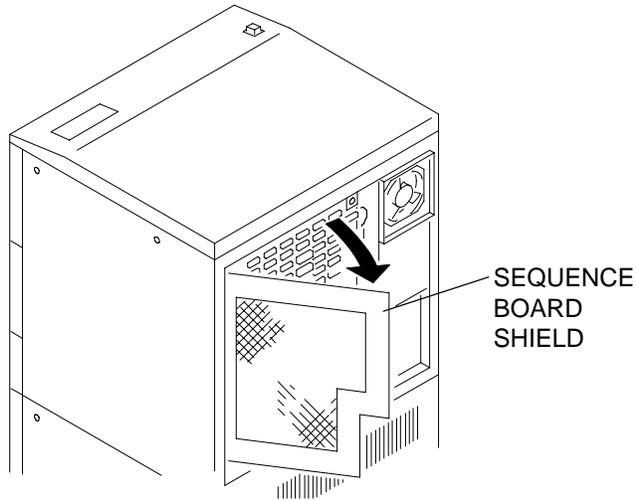
[2] When installing a new board, do the adjustment procedure on Page 5–52.

### 5-PHASE PULSE MOTOR DRIVER BOARD (5PMD)



H129\_1703BCB  
H129\_1703BC

## Sequence Board

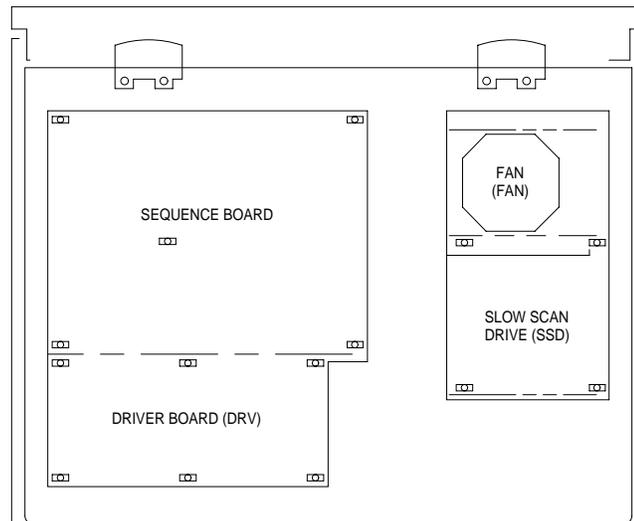


H129\_0601ACA  
H129\_0601AC

### Warning

Dangerous Voltage.

- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3
- [3] Open the SEQUENCE BOARD SHIELD.



H129\_0802BC



### Important

JUMPER information is subject to change with software updates and hardware changes.

**JUMPERS**

[4] Check JUMPER locations listed below with the board being replaced to ensure that no changes have been made.

[5] When installing a new SEQUENCE BOARD, check that the following JUMPERS are installed:

SJ1-1 to SJ1-2

SJ2-1 to SJ2-2

SJ3-1 to SJ3-2

SJ4-2 to SJ4-3

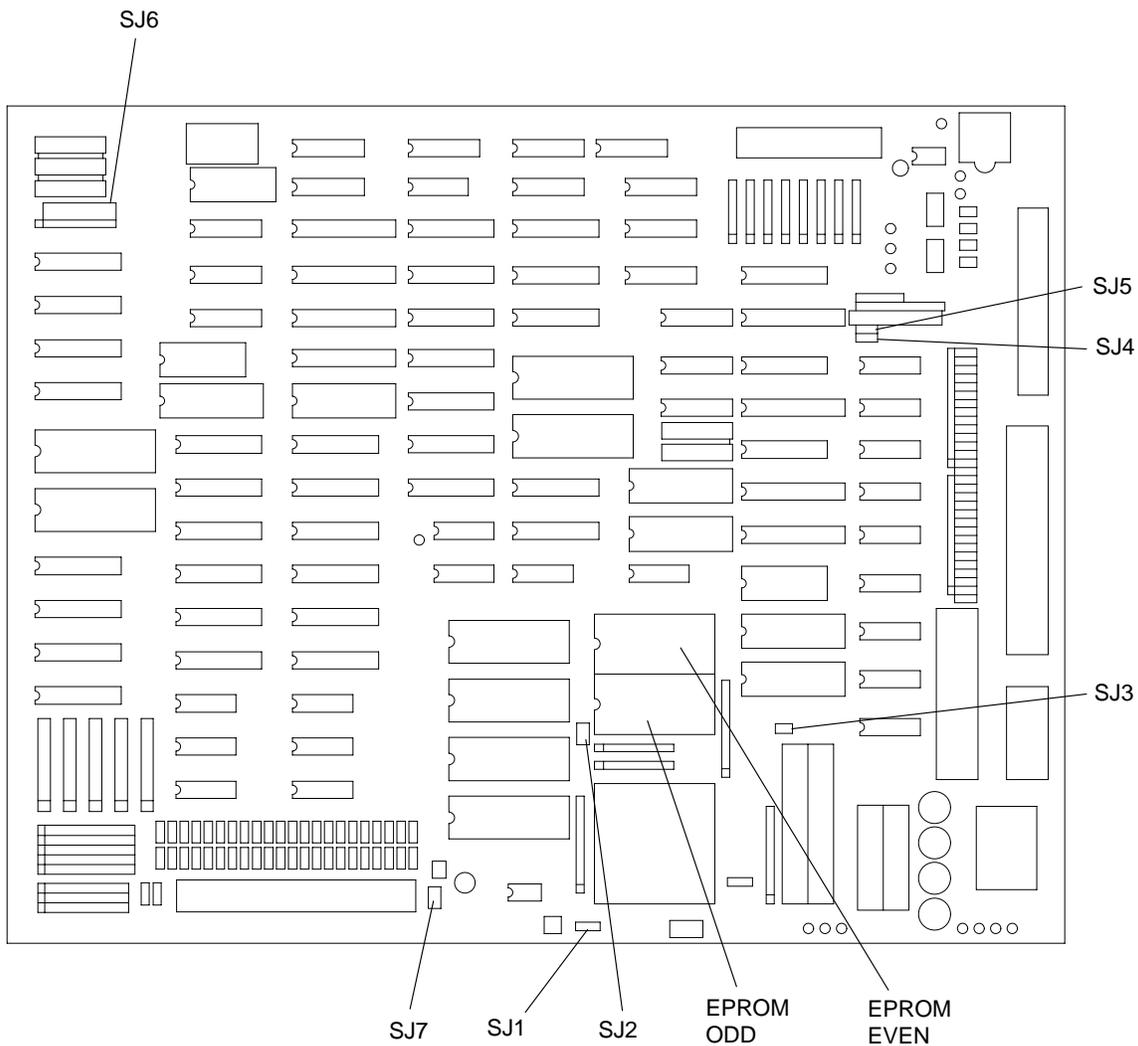
SJ5-2 to SJ5-3

SJ6-1 to SJ6-9, SJ6-2 to SJ6-10, SJ6-3 to SJ6-11, SJ6-4 to SJ6-12, SJ6-5 to SJ6-13, SJ6-6\* to SJ6-14, SJ6-8 to SJ6-16

SJ7-1 to SJ7-2.

\*For printers with serial number 500369 and above, SJ6-6 is open, along with the NEW GUIDE PLATE.

**SEQUENCE BOARD**



H129\_1705DCB  
H129\_1705DC

---

## Install EPROMS



### Caution

Possible damage from electrostatic discharge. Use correct procedures and equipment to prevent damage.

[6] Move the 2 EPROMS from the existing SEQUENCE BOARD to the replacement SEQUENCE BOARD.



### Important

When installing a new SEQUENCE BOARD, do the setup procedure on Page 4-22.

## Slow Scan Motor Board



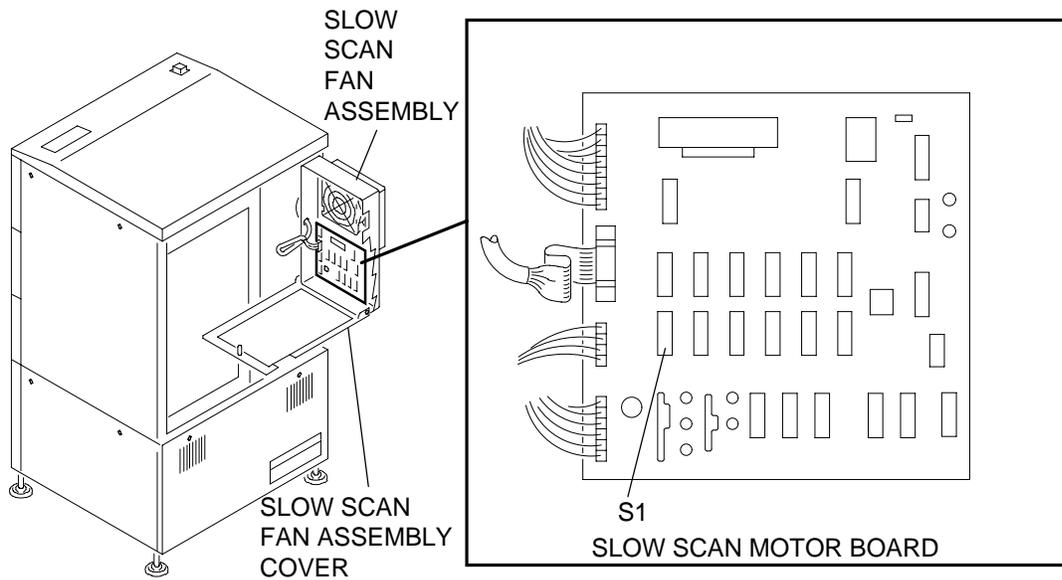
### Warning

Dangerous Voltage. Possible damage to eyes from invisible laser beam.

- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2-3.
- [3] Open the SLOW SCAN FAN ASSEMBLY.
- [4] Open the SLOW SCAN FAN ASSEMBLY COVER.

### SWITCHES

- [5] When installing a new SLOW SCAN MOTOR BOARD, check that the S1 SWITCH Positions 1, 2, 3 and 4 are OFF.



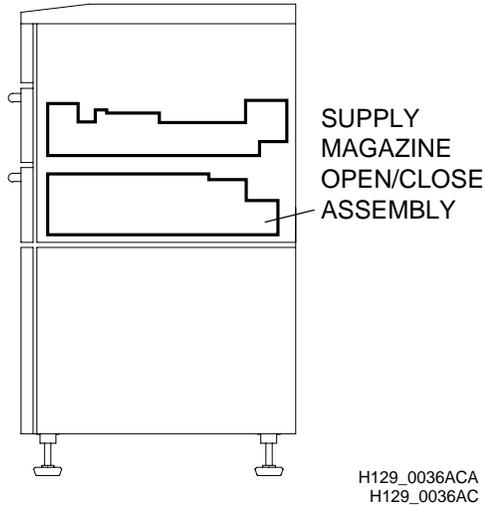
H129\_1714BCA  
H129\_1714BC

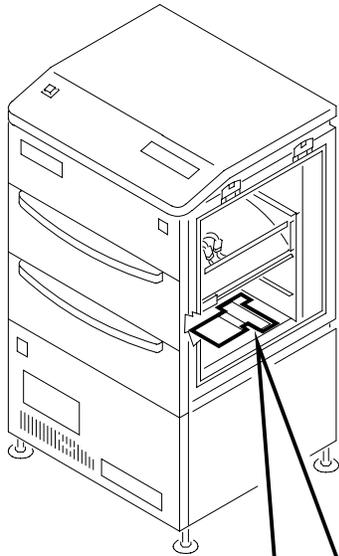
## Laser Diode Power Supply Board

### Note

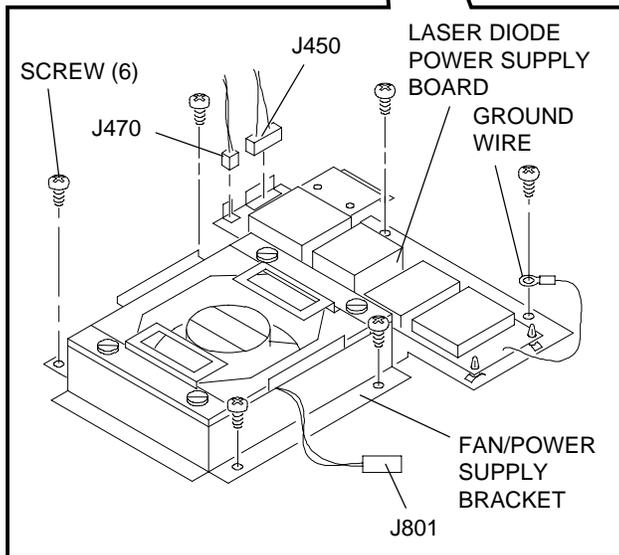
Use this procedure to remove the LASER DIODE POWER SUPPLY BOARD in printers with serial numbers between 500085 and 500200.

- [1] Remove the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY with separation unit. If necessary, see the procedure on Page 2-42.





- [2] Disconnect P/J801.
- [3] Remove the 6 SCREWS to remove the FAN/POWER SUPPLY BRACKET.
- [4] Disconnect P/J450 and P/J470.
- [5] Remove the LASER DIODE POWER SUPPLY BOARD.
- [6] Install the new LASER DIODE POWER SUPPLY BOARD.
- [7] Install the FAN/POWER SUPPLY BRACKET connecting the GROUND WIRE with one of the SCREWS.
- [8] Install the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY with separation unit.



H129\_0611CCA  
H129\_0611CC

## Backplane Board

Use the following table when installing the CP Network Interface in the *Kodak Ektascan* Laser Printer, Model 1120. The JUMPERS that are listed below must be changed on the BACKPLANE BOARD.

VME	Board	≤S/N 500820 ≤S/N 600165	≥S/N 500821 ≥S/N 600166
Slot 1	SYSTEM CONTROLLER	All JUMPERS On	Only j.iack* JUMPER On
Slot 2	MEMORY (6 or 20 MB)	All JUMPERS On	All JUMPERS On
Slot 3	PRINT CONTROLLER	All JUMPERS On	Only iackin* JUMPER Off
Slot 4	EK Interface	All JUMPERS On	All JUMPERS On
Slot 5	EK Interface	All JUMPERS On	All JUMPERS On
Slot 6	EK Interface	All JUMPERS On	All JUMPERS On
Slot 7	EK Interface	All JUMPERS On	All JUMPERS On
Slot 8	EK Interface	All JUMPERS On	All JUMPERS On
Slot 9	EK Interface	All JUMPERS On	All JUMPERS On

# Control Unit Components

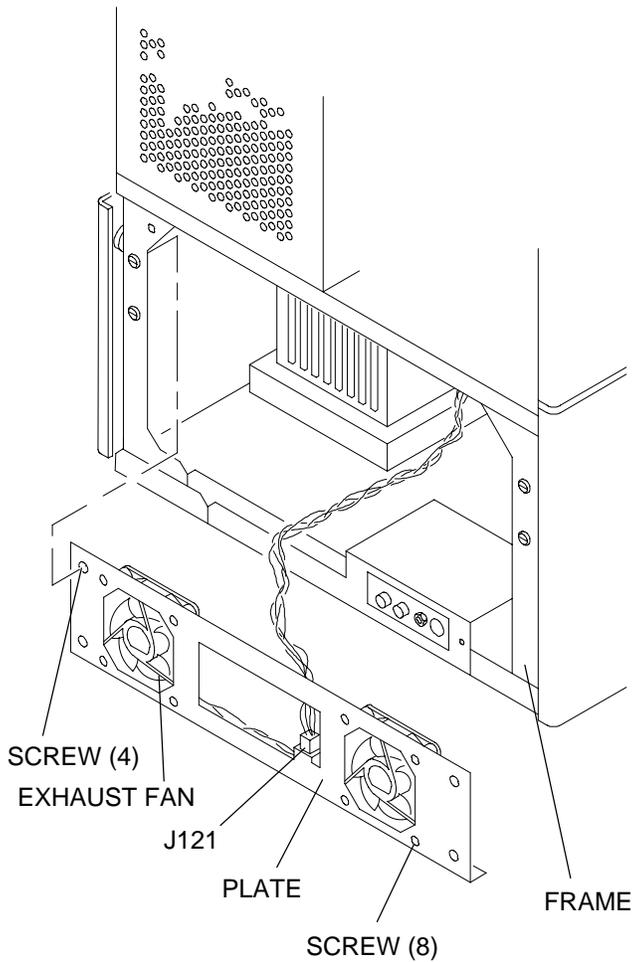
## Exhaust Fans



### Warning

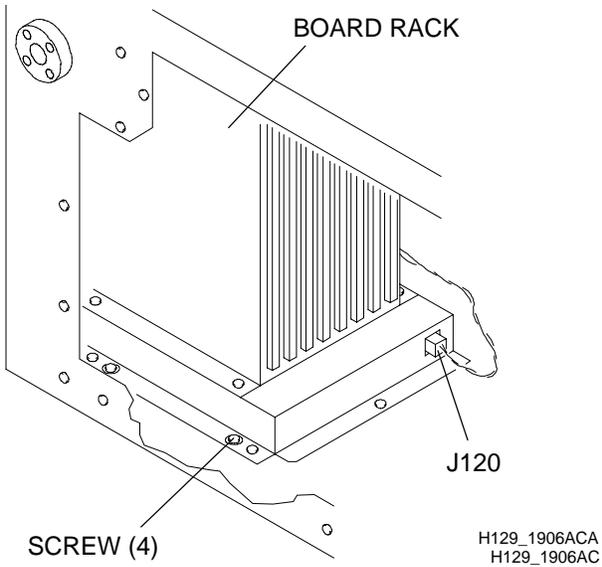
Dangerous Voltage.

- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK CONTROL UNIT COVER.  
If necessary, see the procedure on Page 2-2.
- [3] Loosen the 14 SCREWS to remove the BACK INSIDE COVER.
- [4] Disconnect J121.
- [5] Loosen the 4 SCREWS to remove the PLATE from the FRAME.
- [6] Remove the 8 SCREWS to remove the EXHAUST FAN from the PLATE.



H129\_1905CCA  
H129\_1905CC

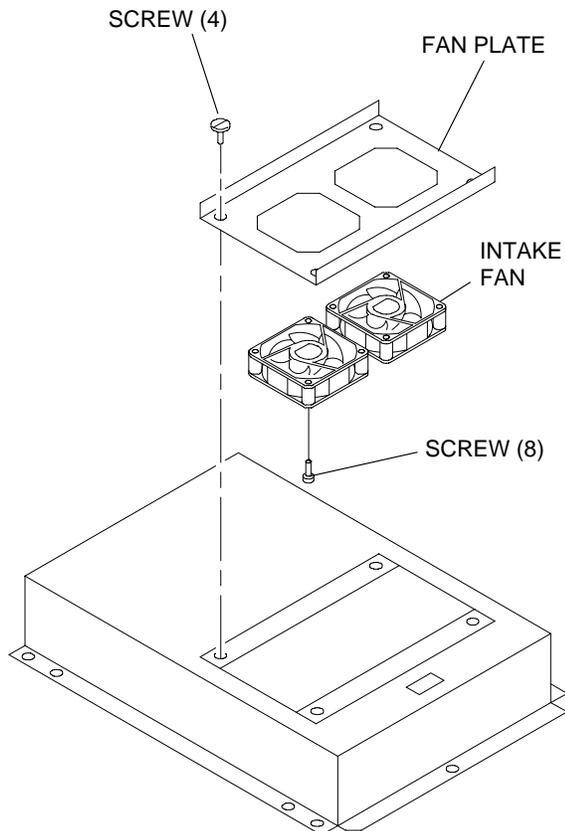
## Intake Fans



### Warning

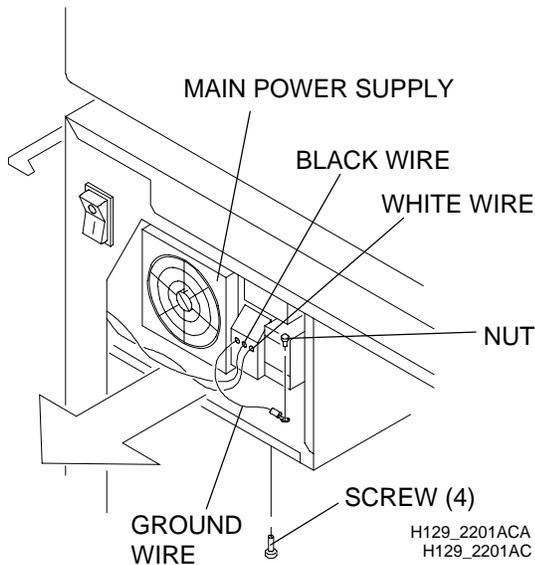
Dangerous Voltage.

- [1] De-energize the LASER PRINTER.
- [2] Remove the FRONT, RIGHT and BACK CONTROL UNIT COVERS. See the procedures if necessary.
- [3] Remove the RIGHT and BACK INSIDE COVERS. See the procedures if necessary.
- [4] Disconnect the FAN CONNECTOR, J120.
- [5] Remove the 4 SCREWS from the CARD RACK.
- [6] Move the CARD RACK toward the back of the LASER PRINTER.
- [7] Loosen the 4 SCREWS to remove the FAN PLATE and 2 FANS.
- [8] Remove the 8 SCREWS to remove both FANS.



H129\_1907CCA  
H129\_1907CC

## Main Power Supply



### Warning

Dangerous Voltage.

- [1] De-energize the LASER PRINTER.
- [2] Remove the FRONT CONTROL UNIT COVER.  
If necessary, see the procedure on Page 2-2.



### Caution

The GROUND WIRE must be replaced in the same configuration when the MAIN POWER SUPPLY is installed.

- [3] Remove the SCREW and disconnect the GROUND WIRE.
- [4] Disconnect the BLACK WIRE and the WHITE WIRE from the POWER SUPPLY.



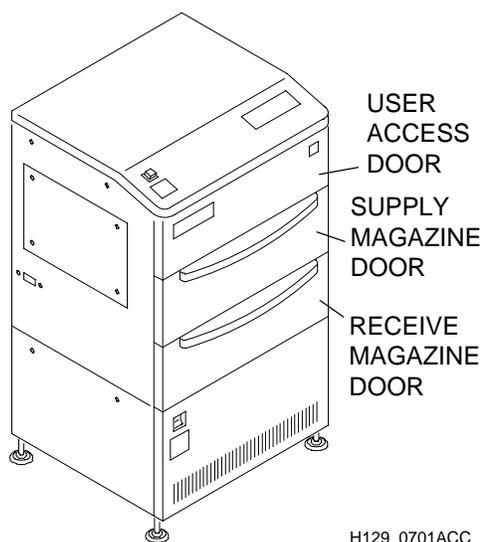
### Important

Make a note of the position of the wires. You must install the wires in the same position on the new POWER SUPPLY.

- [5] Disconnect the wires from the back of the POWER SUPPLY.
- [6] Loosen the 4 SCREWS and pull the POWER SUPPLY toward the front of the LASER PRINTER.

## Image Unit Components

### Optical Unit



H129\_0701ACC  
H129\_0701AC

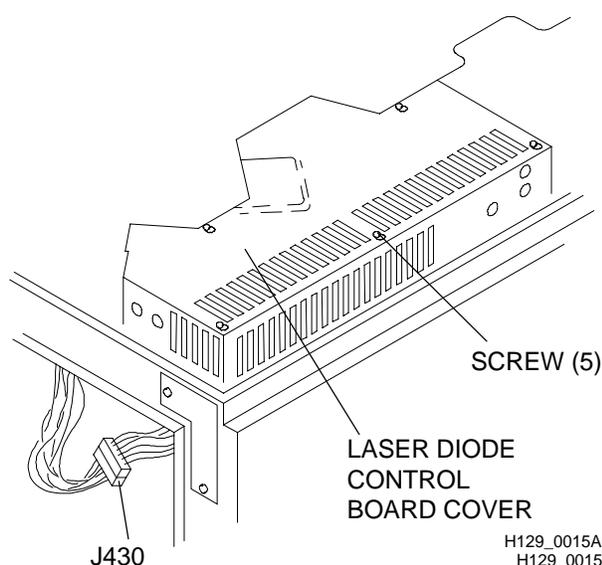
- [1] Energize the LASER PRINTER.
- [2] Press the MAGAZINE DOOR OPEN/CLOSE SWITCH.
- [3] Open the RECEIVE MAGAZINE DOOR.
- [4] Pull down the LATCH and open the USER ACCESS DOOR.



### Warning

- Dangerous Voltage.
- Possible damage to eyes from invisible laser beam. Wear protective eyewear.
- Do not wear jewelry.

- [5] De-energize the LASER PRINTER.
- [6] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [7] Remove the TOP COVER. If necessary, see the procedure on Page 2–5.

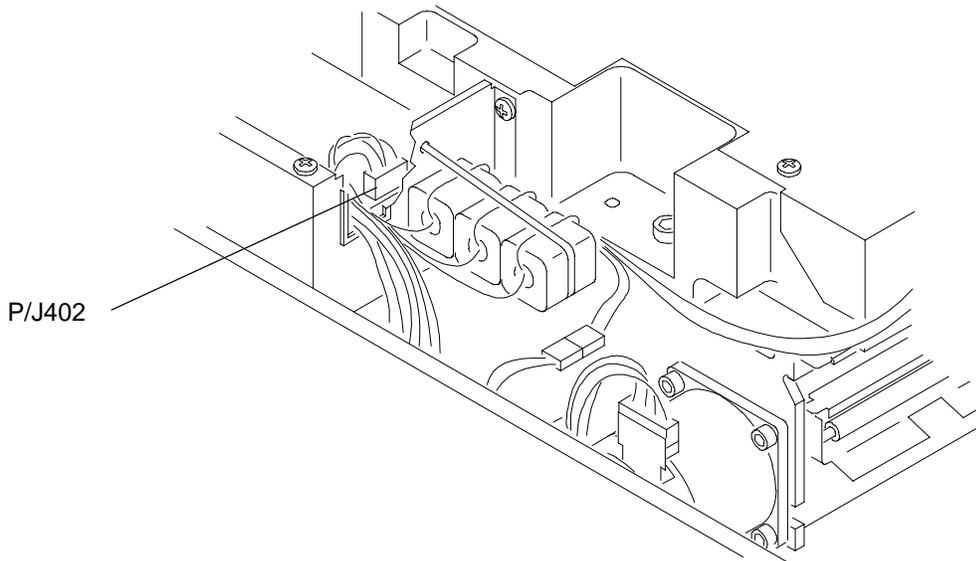


H129\_0015ACB  
H129\_0015AC

- [8] Disconnect J430.
- [9] Loosen the 5 SCREWS to remove the LASER DIODE CONTROL BOARD COVER.

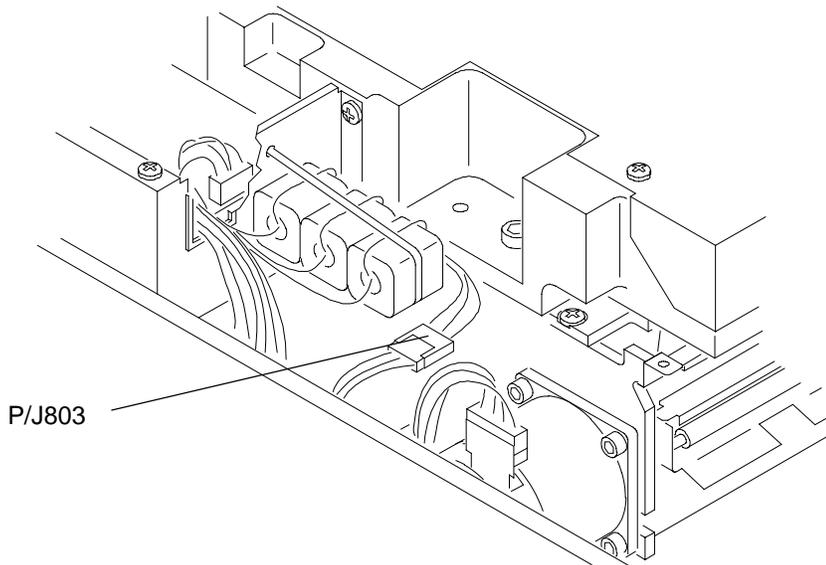
[10] Remove the FIBER OPTIC CABLE

- (a) For LASER PRINTERS with serial numbers 500024 - 500085, disconnect P/J402.



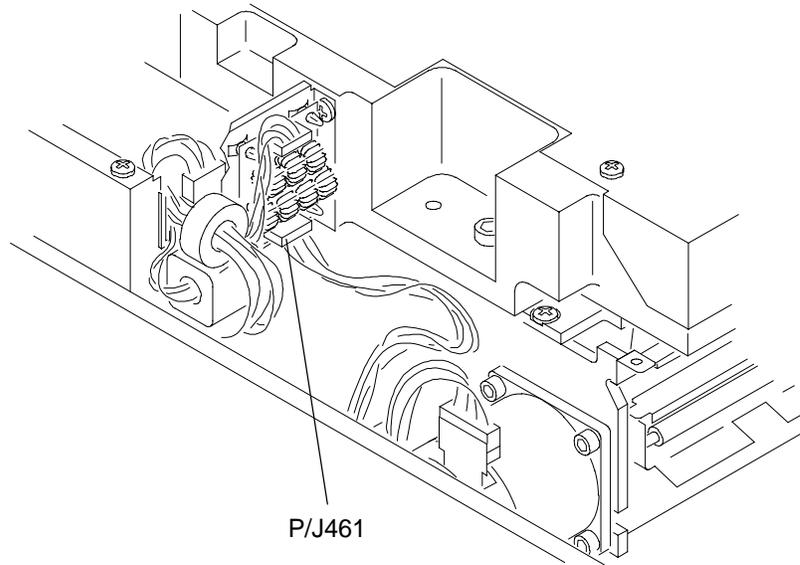
H129\_2907BCA  
H129\_2907BC

- (b) For LASER PRINTERS with serial numbers 500086 - 500200, disconnect P/J803



H129\_2906BCA  
H129\_2906BC

(c) For LASER PRINTERS with serial numbers 500201 and up, disconnect P/J461

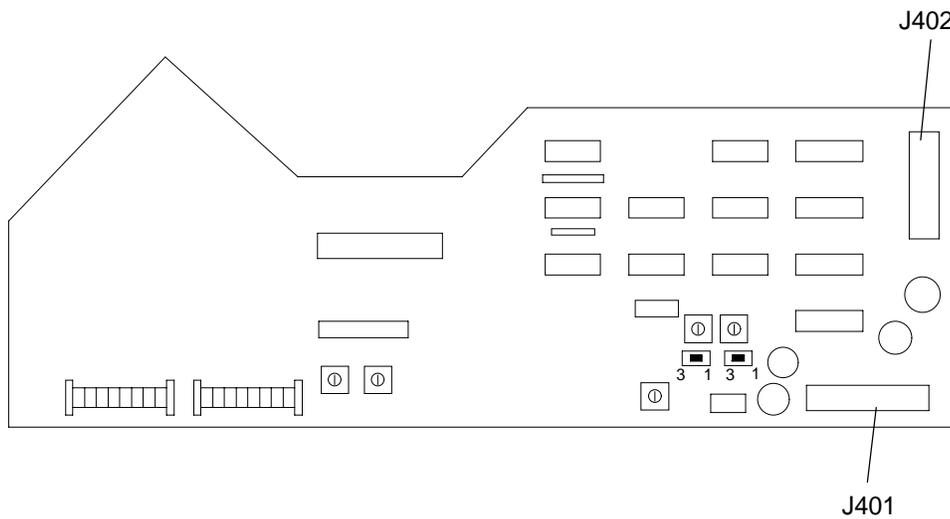


H129\_2908BCA  
H129\_2908BC

[11] Loosen the 5 SCREWS to remove the OPTICAL UNIT COVER.

[12] Disconnect J402 on the LASER DIODE CONTROL BOARD.

**LASER DIODE CONTROL BOARD**



H129\_1707BCB  
H129\_1707BC

[13] Remove the 3 ALLEN SCREWS.

[14] Lift and remove the OPTICAL UNIT.



**Important**

If installing a new OPTICAL UNIT, do the following steps.

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs       5 Debug Utility
3 Boards Diag
Enter Menu Item:
    
```

[15] Energize the LASER PRINTER.

[16] Use the PORTABLE COMPUTER to display the CES Main Menu.

```

SYSTEM PARAMETERS MENU
1 Set Date/Time     4 Show Software Ver
2 System Statistics 5 MMB Config
3 System Config     6 FILM Config
Enter Menu Item:
    
```

[17] Enter [4] for "System Params".

```

SYSTEM STATISTICS
Actuation Counter: XXXX
    
```

[18] Enter [2] for "System Statistics".

```

Actuation Counter: XXXX
Laser on hours: 0
    
```

[19] Press [ENTER].

```

Laser on hours: 0
Select (R)epeat or (S)ave:
    
```

[20] Enter [0] for the number of Laser on hours.

```

Select (R)epeat or (S)ave: S
Complete
Hit any key to continue:
    
```

[21] Select [S] to save.

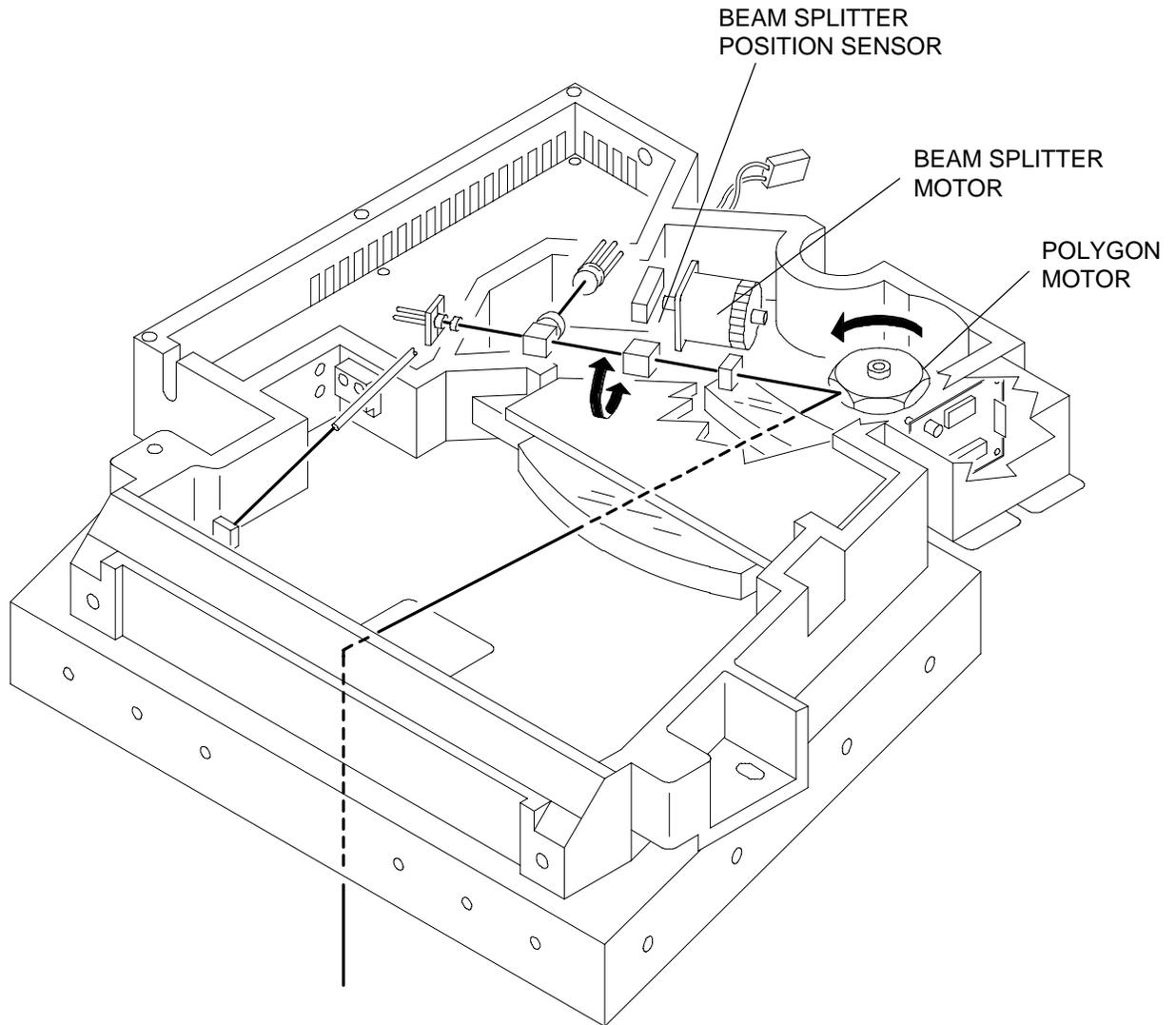
[22] Press [ESC] 4 times to exit diagnostics.

**Note**

For information about installing a UNIVERSAL OPTICAL UNIT, see "Installing a Universal Optical Unit" in the Installation Instructions.

## Optical Unit Components

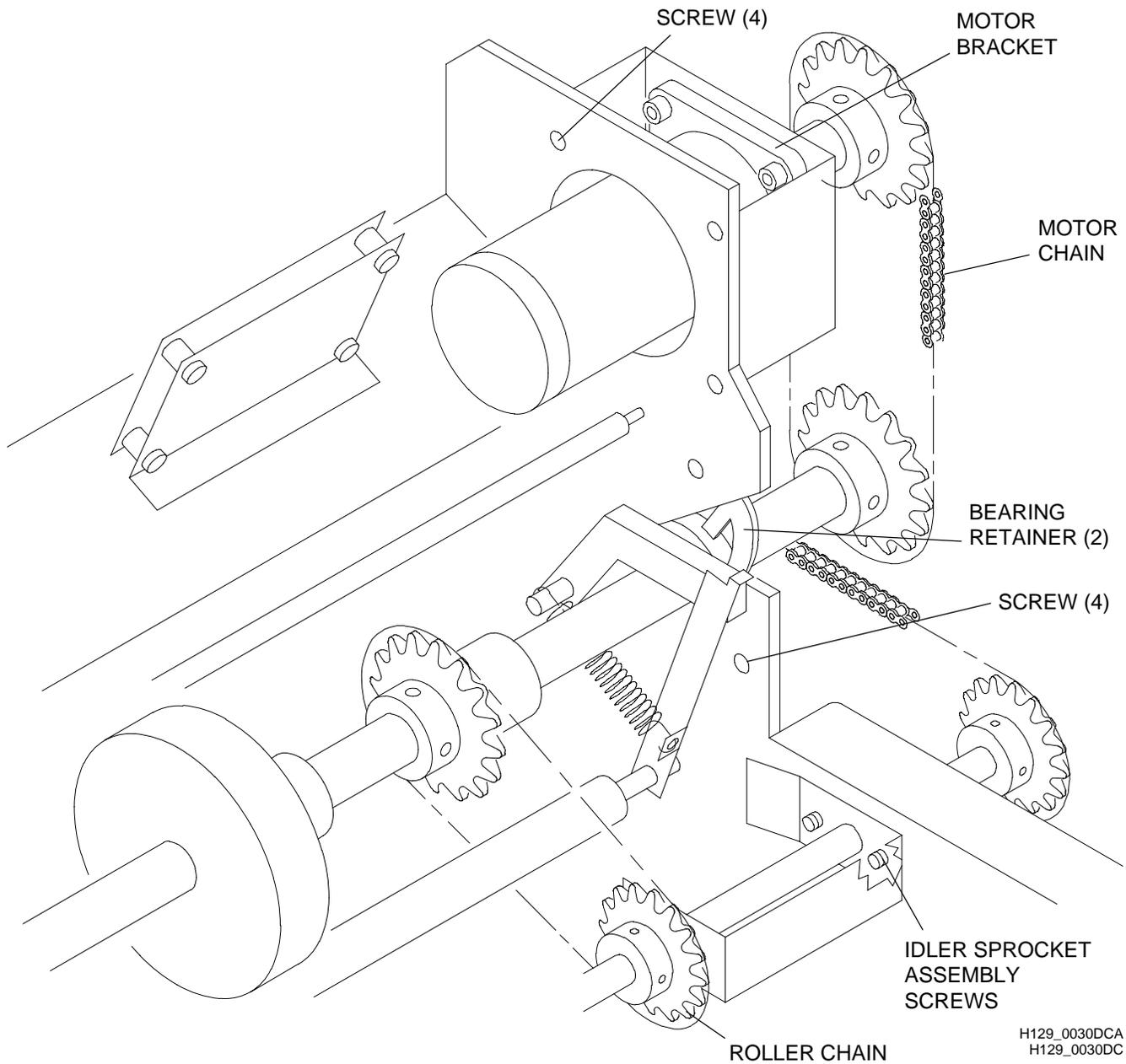
Component	Replacement Notes
COVER	Do not allow dust on the COVER to enter the OPTICAL UNIT.
BEAM SPLITTER MOTOR	Remove the MOTOR from the BASE by removing the 4 SCREWS.
BEAM SPLITTER POSITION SENSOR	Remove the BEAM SPLITTER POSITION SENSOR by removing 2 SCREWS.
POLYGON MOTOR UNIT	Place the PROTECTIVE COVER over the POLYGON before removing the unit. The PROTECTIVE COVER is shipped with the replacement unit.



H129\_2900DCB  
H129\_2900DC

## R Transportation Roller Assembly

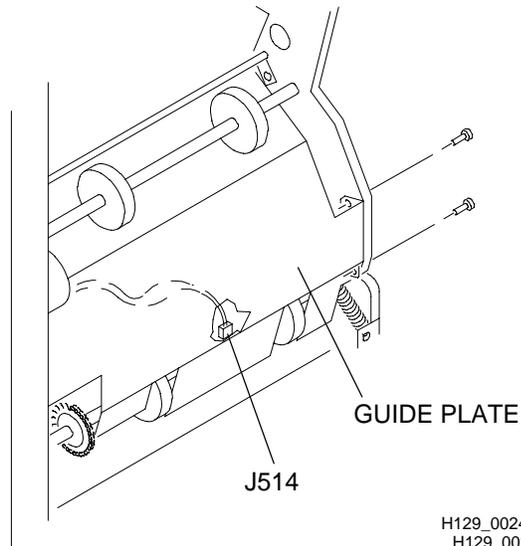
- [1] Remove the OPTICAL UNIT, SLOW SCAN ASSEMBLY, OUTLET GUIDE PLATE ASSEMBLY and RECEIVE MAGAZINE OPEN/CLOSE ASSEMBLY. See the procedures in this section if necessary.
- [2] Loosen the 2 IDLER SPROCKET ASSEMBLY SCREWS.
- [3] Remove the ROLLER CHAIN from the ROLLER SHAFT.
- [4] Loosen the 4 SCREWS on the MOTOR BRACKET.
- [5] Remove the MOTOR CHAIN from the GEAR.
- [6] Remove the 4 SCREWS and 2 BEARING RETAINERS.
- [7] Slide the ROLLER through the groove in the FRAME.



H129\_0030DCA  
H129\_0030DC

## S Transportation Roller Assembly

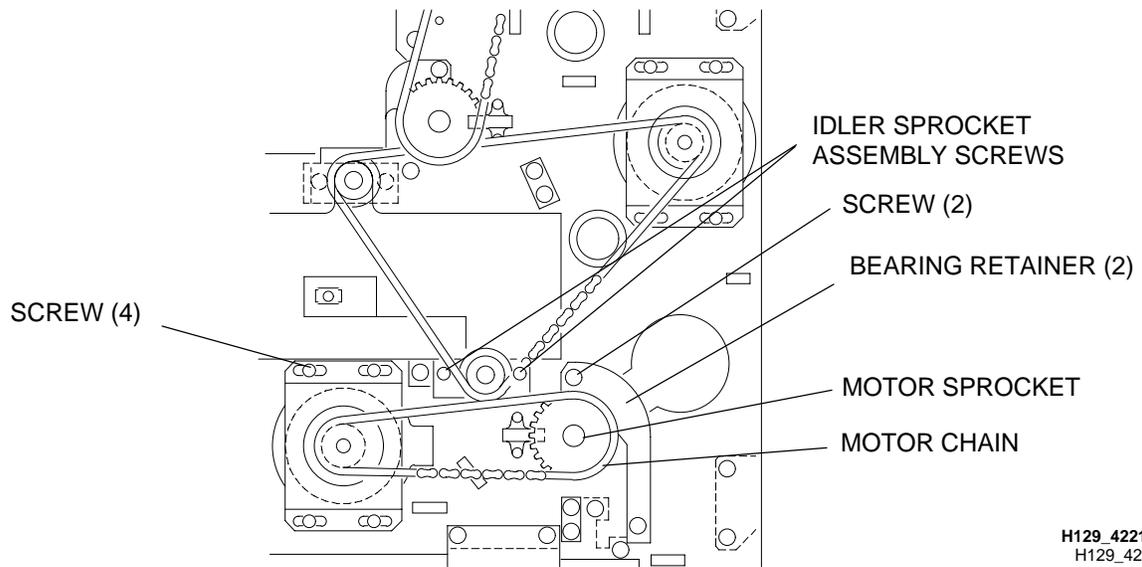
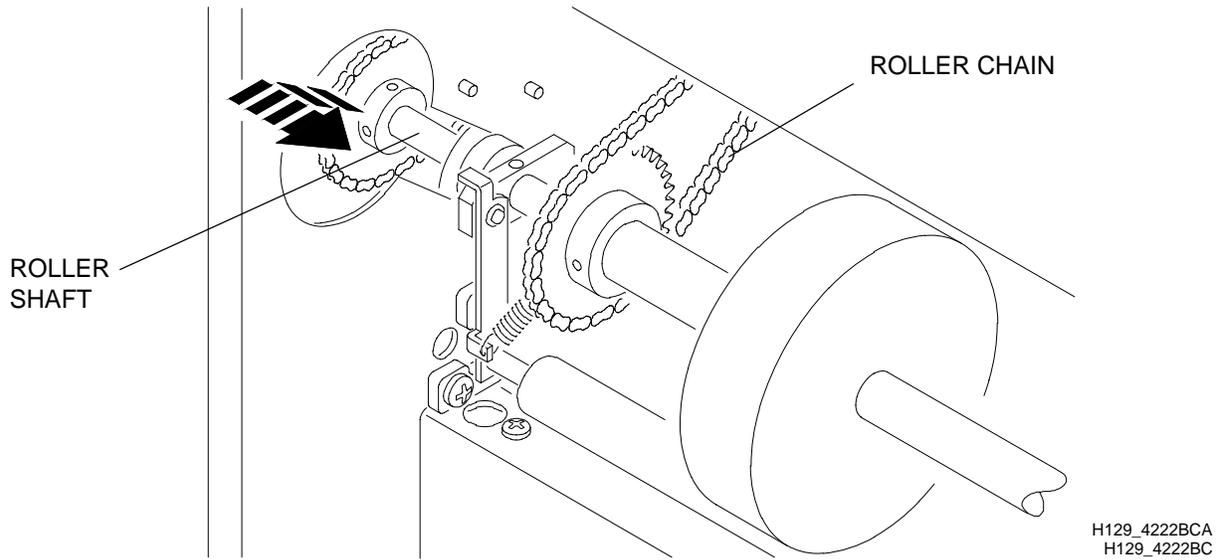
- [1] Remove the LEFT IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [2] Remove the GUIDE PLATE and CONNECTOR J514.



- [3] Loosen the 2 IDLER SPROCKET ASSEMBLY SCREWS.
- [4] Remove the ROLLER CHAIN from the ROLLER SHAFT.
- [5] Loosen the 4 SCREWS on the MOTOR BRACKET.
- [6] Remove the MOTOR CHAIN from the SPROCKET.

[7] Remove the 4 SCREWS and 2 BEARING RETAINERS.

[8] Slide the ROLLER through the groove in the FRAME.



## Outlet Guide Plate Assembly

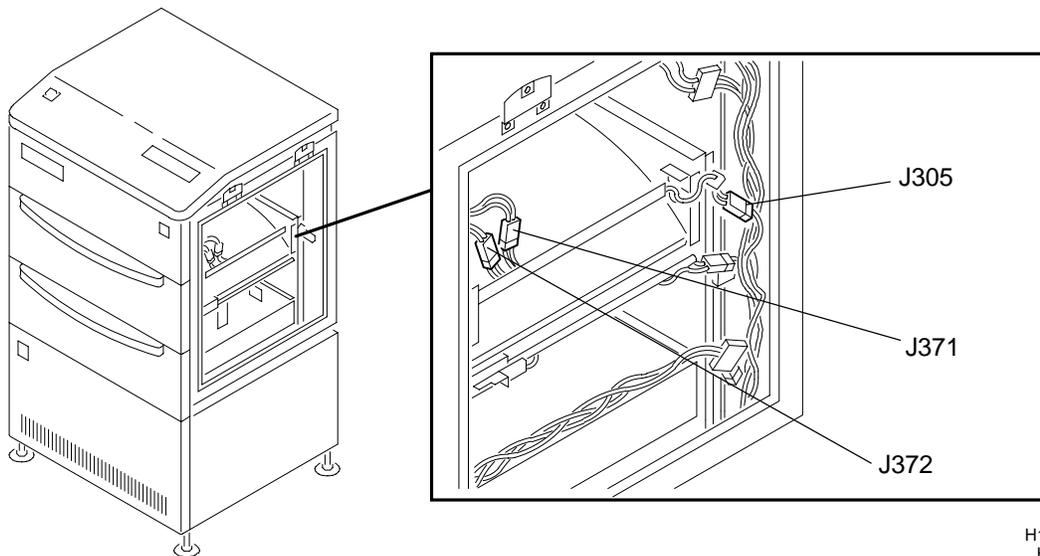
- [1] Open the RECEIVE MAGAZINE DOOR.
- [2] Pull down the LATCH and open the USER ACCESS DOOR.



### Warning

Dangerous Voltage. Possible damage to eyes from invisible laser beam.

- [3] De-energize the LASER PRINTER.
- [4] Remove the TOP COVER. If necessary, see the procedure on Page 2–5.
- [5] Remove the RIGHT IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [6] Disconnect J305, J371 and J372.
- [7] Mark the position of the GUIDE PLATE BRACKET on the FRAME.
- [8] Remove the 4 SCREWS.
- [9] Lift and slide the GUIDE PLATE out of the PRINTER.



H129\_0713BCA  
H129\_0713BC

[10] Mark the position of the GUIDE PLATE BRACKET on the FRAME.

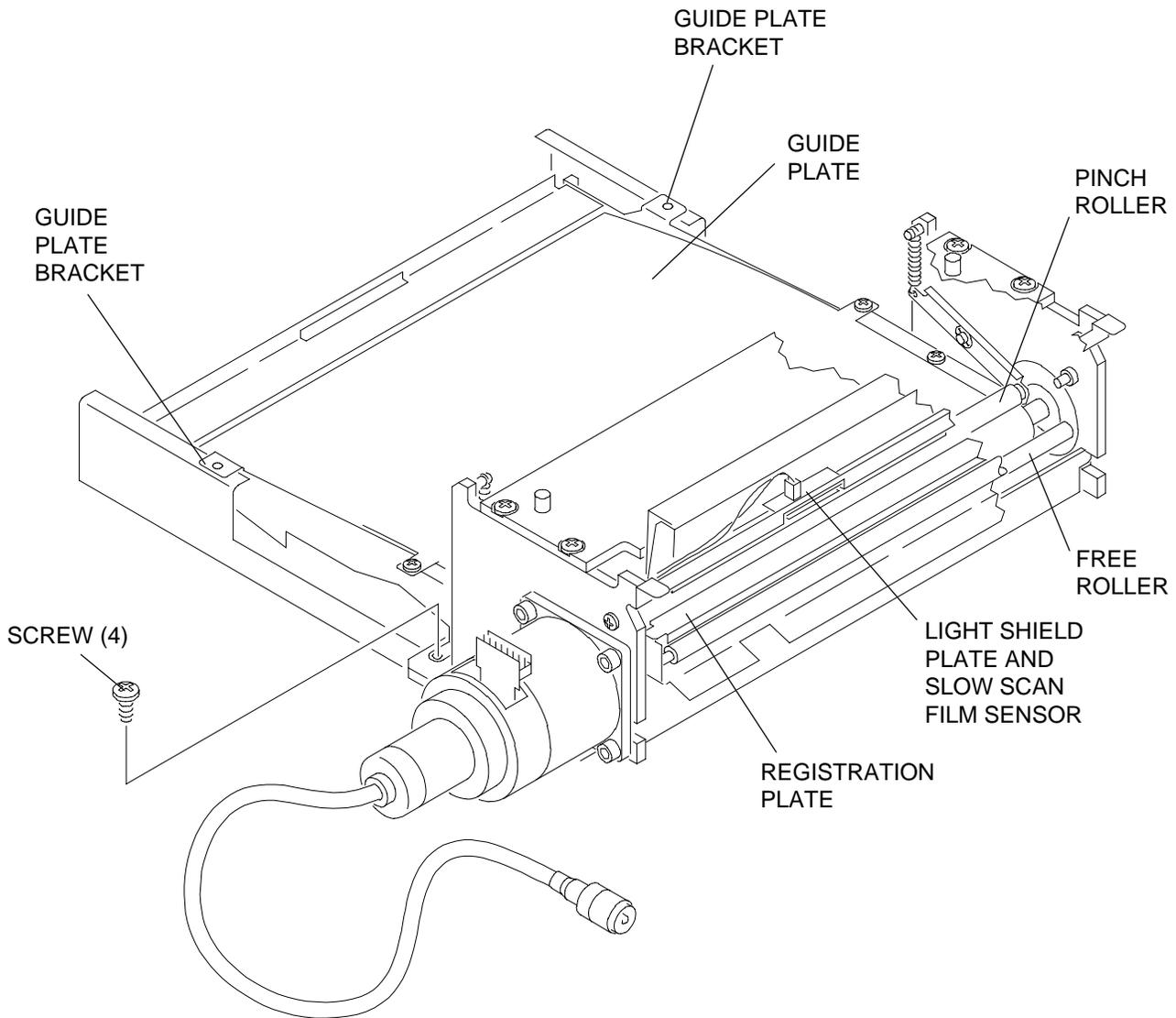
[11] Remove the 4 SCREWS.

[12] Lift and slide the GUIDE PLATE out of the PRINTER.



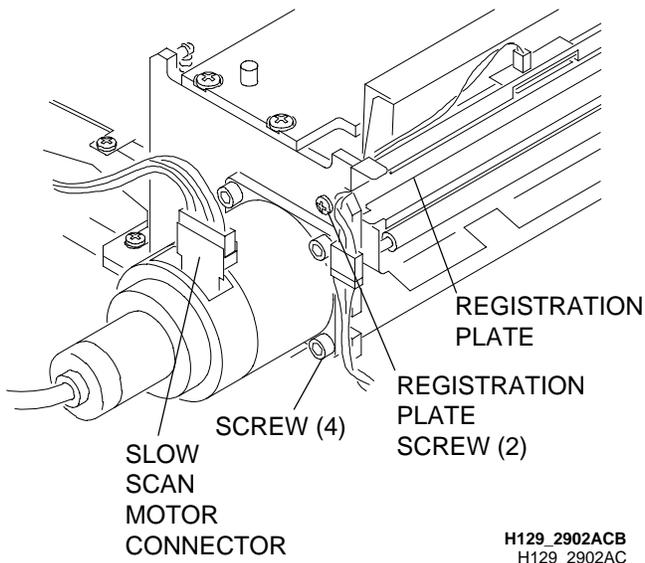
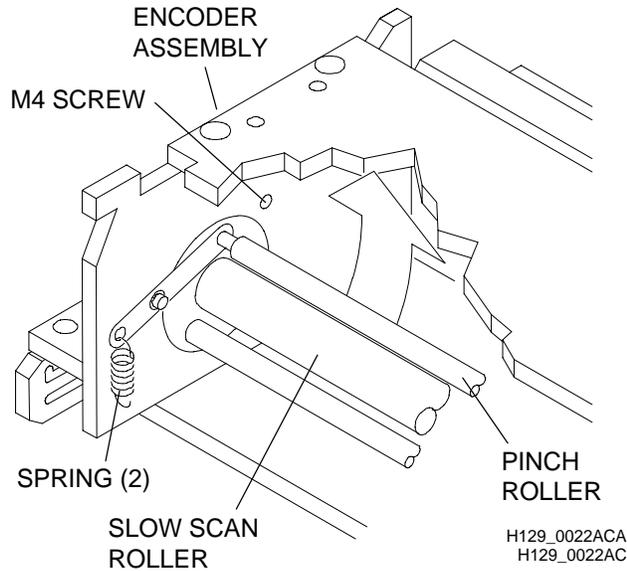
**Important**

Do not allow the GUIDE PLATE to slide against the frame of the LASER PRINTER.



H129\_3001DCA  
H129\_3001DC

## Slow Scan and Encoder Assembly



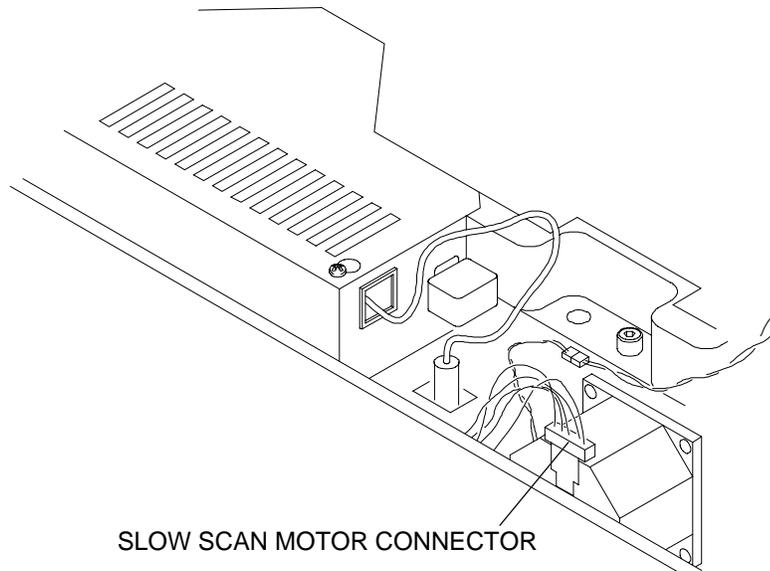
- [1] Open the RECEIVE MAGAZINE DOOR.
- [2] Pull down the LATCH and open the USER ACCESS DOOR.



### Warning

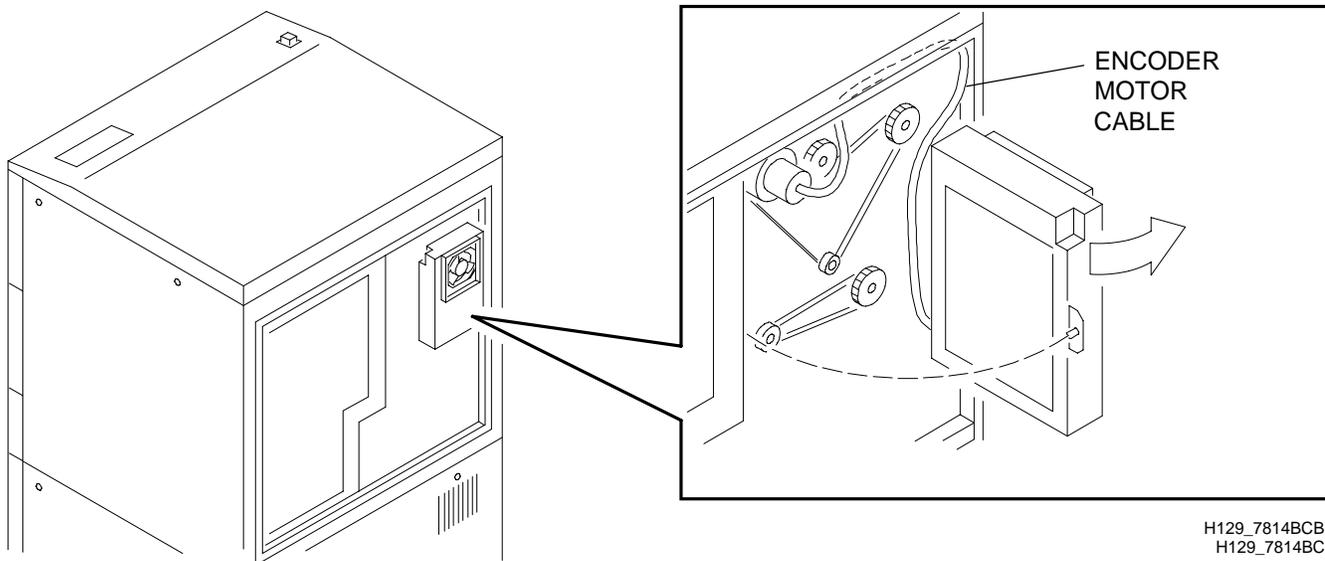
Dangerous Voltage. Possible damage to eyes from laser beam.

- [3] De-energize the LASER PRINTER.
- [4] Remove the TOP COVER. If necessary, see the procedure on Page 2-5.
- [5] Remove the OPTICAL UNIT. If necessary, see the procedure on Page 2-29.
- [6] Remove the OUTLET GUIDE PLATE ASSEMBLY. If necessary, see the procedure on Page 2-37.
- [7] Remove the 2 SPRINGS.



H129\_0018BCC  
H129\_0018BC

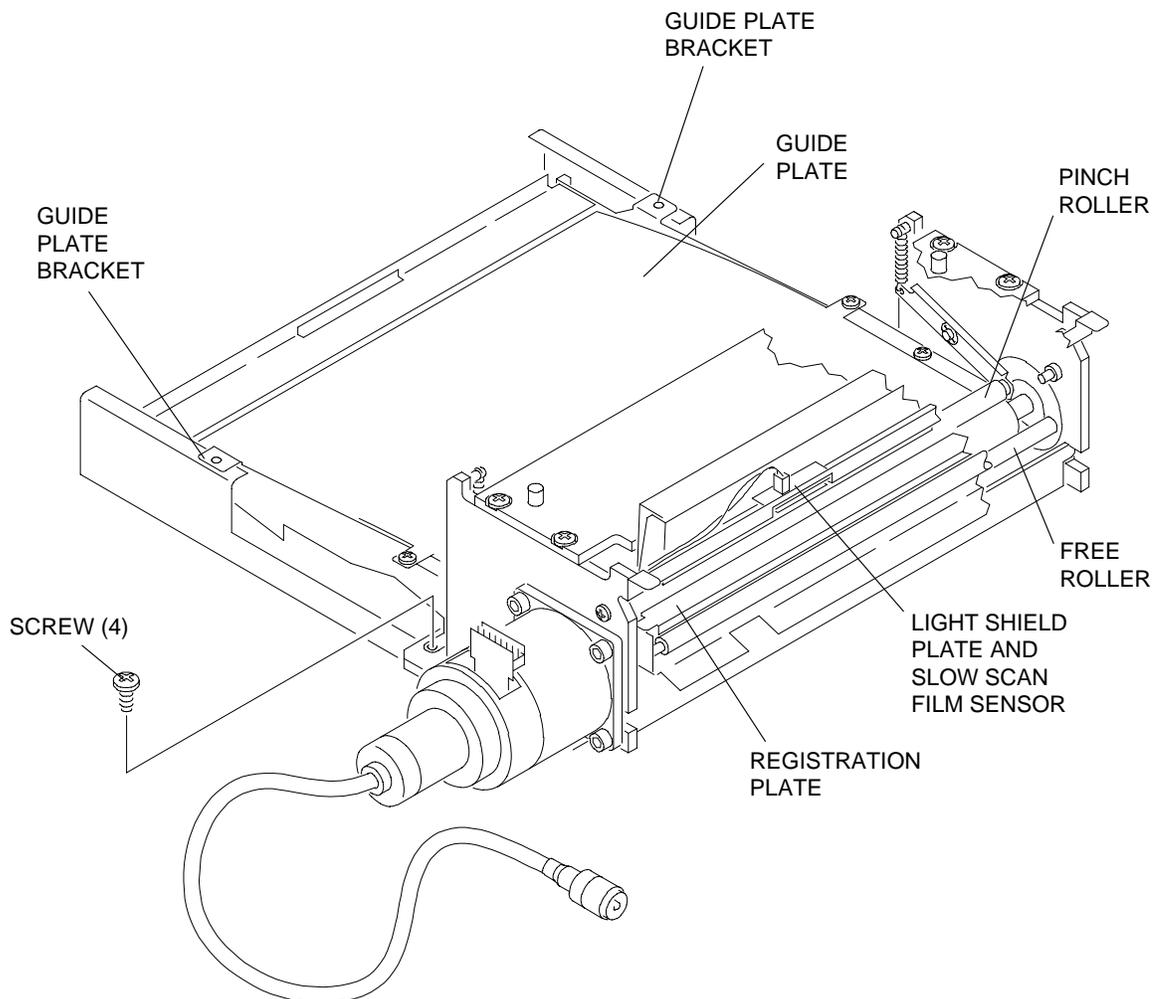
- [8] Loosen the 2 REGISTRATION PLATE SCREWS.
- [9] Rotate the REGISTRATION PLATE upward.
- [10] Install the 2 REGISTRATION PLATE SCREWS removed in Step 8 to hold the REGISTRATION PLATE in the up position.
- [11] Disconnect the SLOW SCAN MOTOR CONNECTOR.
- [12] Disconnect the ENCODER CABLE from the SLOW SCAN DRIVER BOARD. Remove the WIRE TIES if necessary.
- [13] Remove the 4 SCREWS.
- [14] Lift and hold the PINCH ROLLER away from the SLOW SCAN ROLLER.
- [15] Lift and pull out the ENCODER ASSEMBLY.



H129\_7814BCB  
H129\_7814BC

## Slow Scan Assembly Components

Component	Replacement Notes
REGISTRATION PLATE	
GUIDE PLATE	
FREE ROLLER	Do not drop the BEARINGS or scratch the ROLLER.
LIGHT SHIELD PLATE AND SLOW SCAN FILM SENSOR	Disconnect the CONNECTOR before removing the SENSOR.
PINCH ROLLER	<ul style="list-style-type: none"> <li>• Remove the 2 SPRINGS.</li> <li>• Remove the WASHERS and E RINGS from the LEVER.</li> <li>• Remove the PINS.</li> <li>• Remove the WASHERS and E RINGS from the ROLLER.</li> <li>• Do not scratch the PINCH ROLLER.</li> <li>• Clean the NIP ROLLER before assembly.</li> </ul>



H129\_3001DCA  
H129\_3001DC

## Supply Magazine Open/Close Assembly with Separation Unit

[1] Remove the SUPPLY MAGAZINE.



### Warning

Dangerous Voltage. Possible damage to eyes from invisible laser beam.

[2] De-energize the LASER PRINTER.

[3] Remove the RIGHT IMAGE UNIT COVER. If necessary, see the procedure on Page 2-3.

[4] Disconnect the following connectors from the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY:

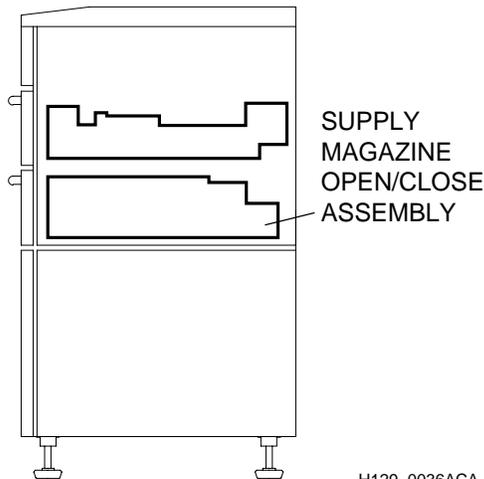
J320

J321

J322

J302

J303.



### Caution

The SUCKER PADS must be in the up position.

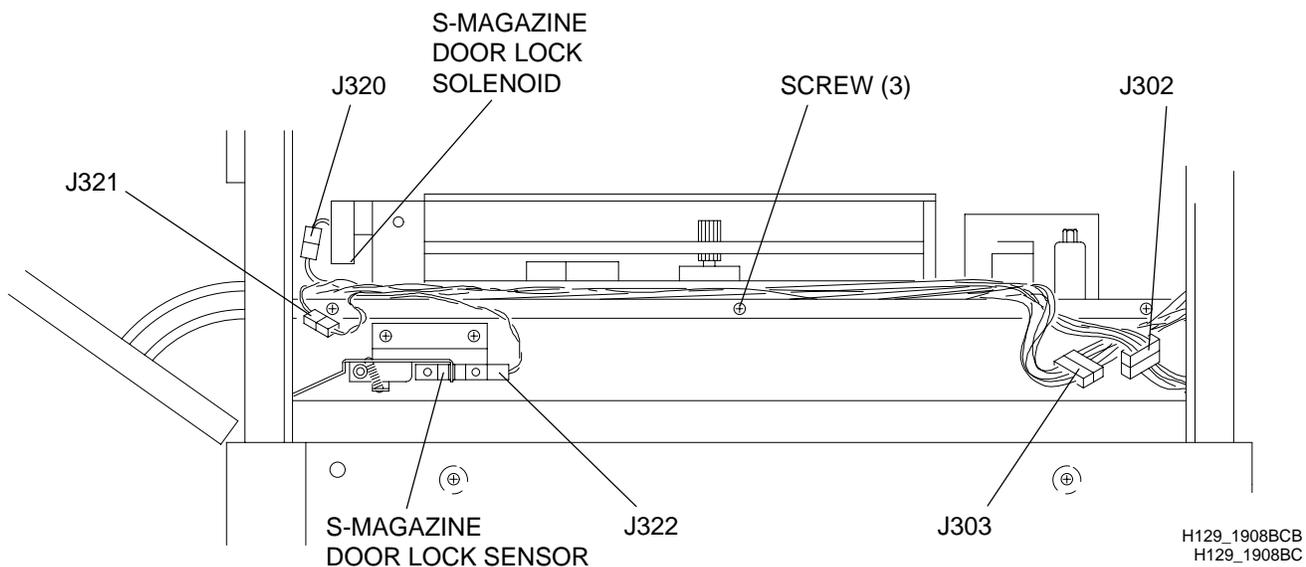
[5] Remove the 3 SCREWS.

[6] Lift the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY a small amount, and pull the unit out.



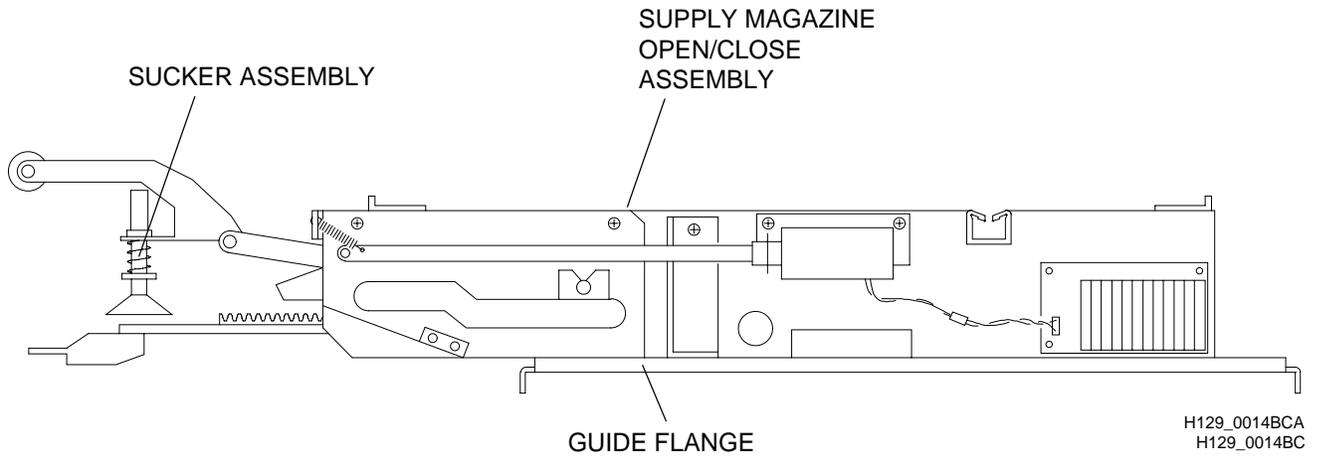
### Caution

The assembly will contact the S-MAGAZINE DOOR LOCK SOLENOID if lifted too high.

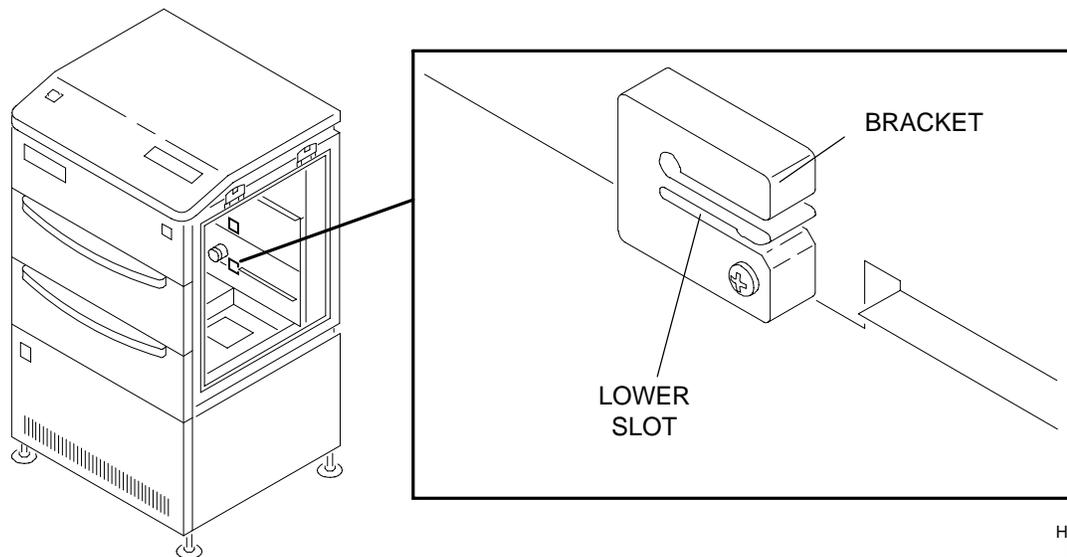


**Installation Notes:**

- [7] Check that the SUCKER ASSEMBLY is in the up position before installing the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY with SEPARATION UNIT.

**Note**

The GUIDE FLANGE on the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY with SEPARATION UNIT slides into the LOWER SLOT of the BRACKET.



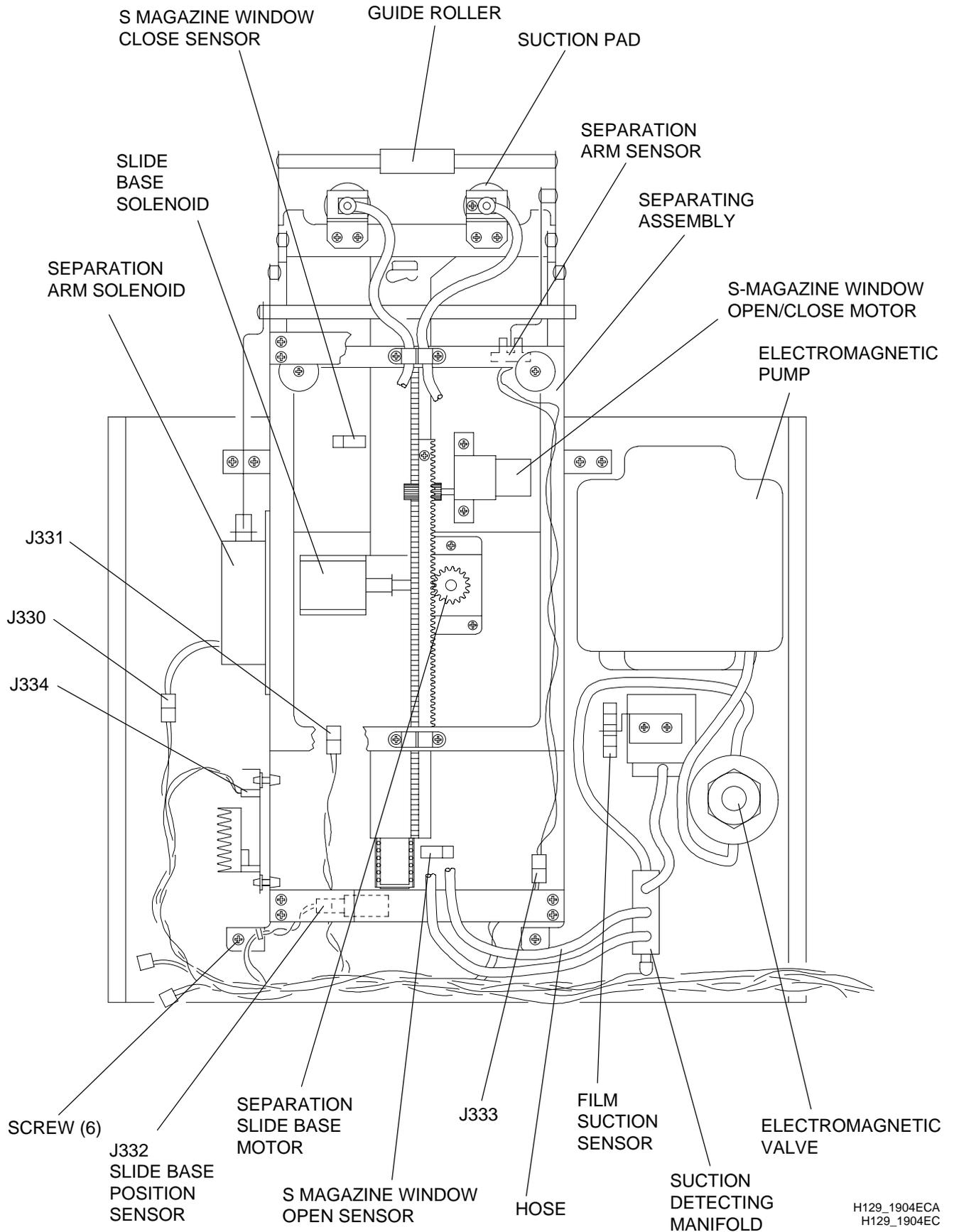
## Supply Magazine Open/Close Assembly Components

Component	Replacement Notes
ELECTROMAGNETIC PUMP	Remove the HOSE and CONNECTOR before the ELECTROMAGNETIC PUMP.
ELECTROMAGNETIC VALVE	
SUCTION DETECTING MANIFOLD	
S-MAGAZINE WINDOW CLOSE SENSOR	<ul style="list-style-type: none"> <li>• Make a mark to indicate the position of the SENSOR BRACKET on the FRAME before removing it.</li> <li>• Remove this part when the SEPARATING ASSEMBLY is fastened to the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY.</li> </ul>
S-MAGAZINE WINDOW OPEN SENSOR	<ul style="list-style-type: none"> <li>• Make a mark to indicate the position of the SENSOR BRACKET on the FRAME before removing it.</li> <li>• Remove this part when the SEPARATION ASSEMBLY is fastened to the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY.</li> </ul>
MOTOR	Remove this part when the SEPARATION ASSEMBLY is fastened to the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY.

## Separation Assembly

- [1] Remove the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY. If necessary, see the procedure on Page 2-42.
- [2] Disconnect the following CONNECTORS:
  - J330
  - J331
  - J332
  - J333
  - J334
- [3] Remove the HOSE.
- [4] Mark the SEPARATION ASSEMBLY with a line to indicate the correct position.
- [5] Remove the 6 SCREWS to remove the SEPARATION ASSEMBLY from the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY.

**SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY with SEPARATION ASSEMBLY**

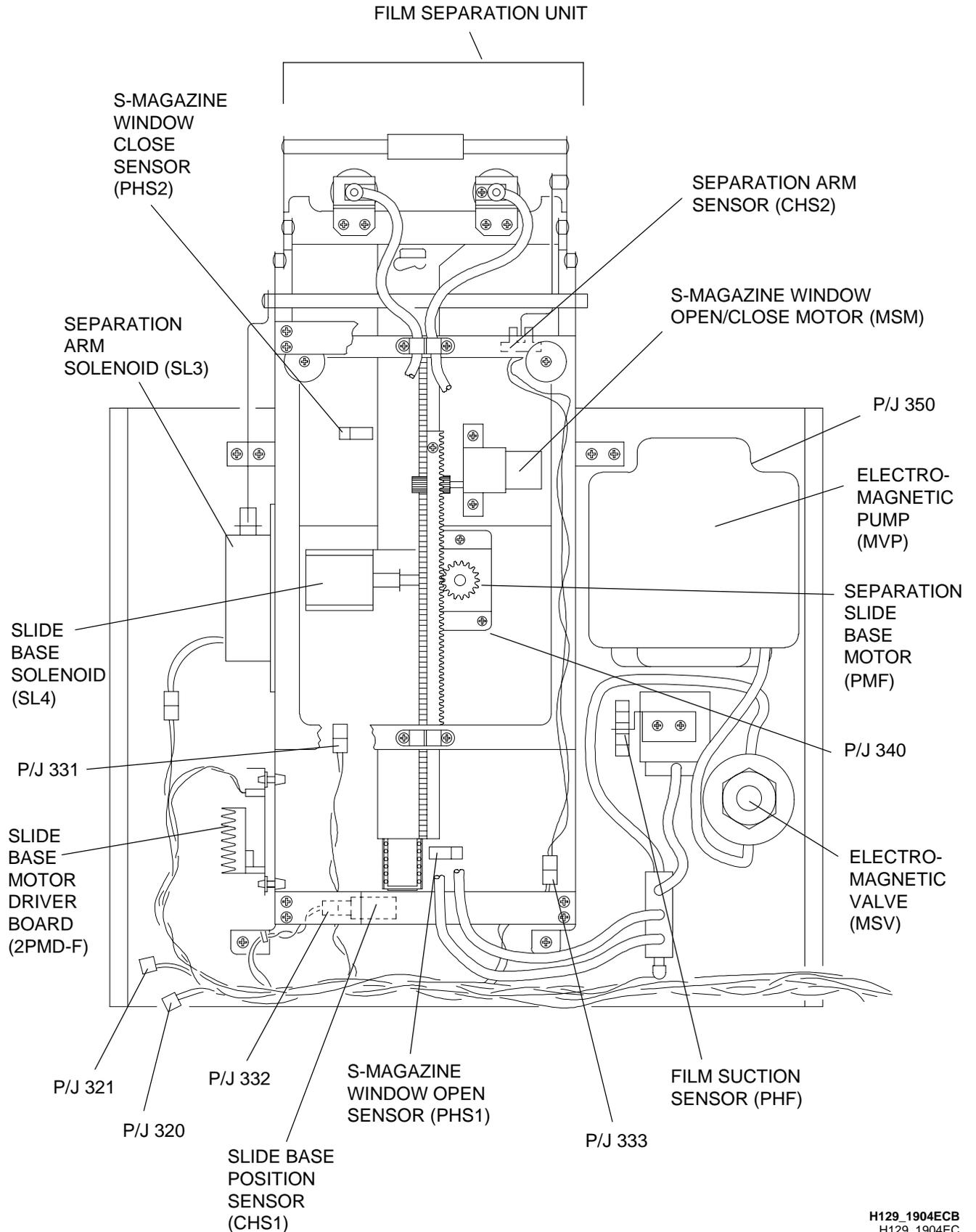


H129\_1904ECA  
H129\_1904EC

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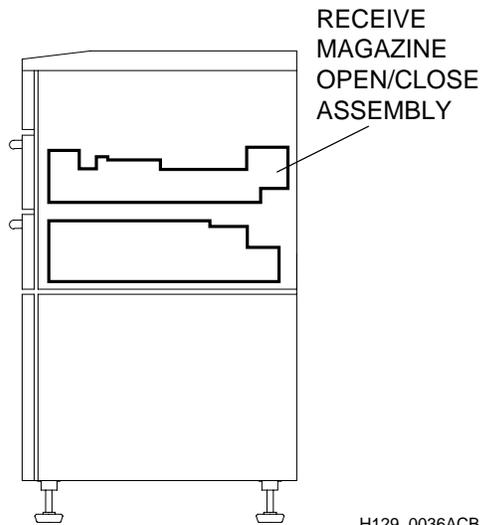
**Separation Assembly Components**

<b>Component</b>	<b>Replacement Notes</b>
SLIDE BASE MOTOR	
SLIDE BASE SOLENOID	
SEPARATION ARM SOLENOID	It is not necessary to remove the SEPARATION ASSEMBLY from the BASE PLATE to remove these components.
FILM SUCTION SENSOR	
SLIDE BASE POSITION SENSOR	
GUIDE ROLLER	Remove both GUIDE ROLLERS.
SLIDE BASE	<ul style="list-style-type: none"><li>• Remove the LINK MECHANISM with the SLIDE BASE.</li><li>• Keep the WASHERS.</li></ul>
SUCTION PAD	It is not necessary to remove the SEPARATING UNIT to remove the SUCTION PAD.



H129\_1904ECB  
H129\_1904EC

## Receive Magazine Open/Close Assembly



H129\_0036ACB  
H129\_0036AC



### Warning

Dangerous Voltage. Possible damage to eyes from invisible laser beam.

- [1] Remove the TOP COVER.
- [2] Remove the OUTLET GUIDE PLATE ASSEMBLY.
- [3] Remove the RECEIVE MAGAZINE.
- [4] Disconnect the following from the RECEIVE MAGAZINE OPEN/CLOSE ASSEMBLY:

J301  
J304  
J310  
J311  
J312

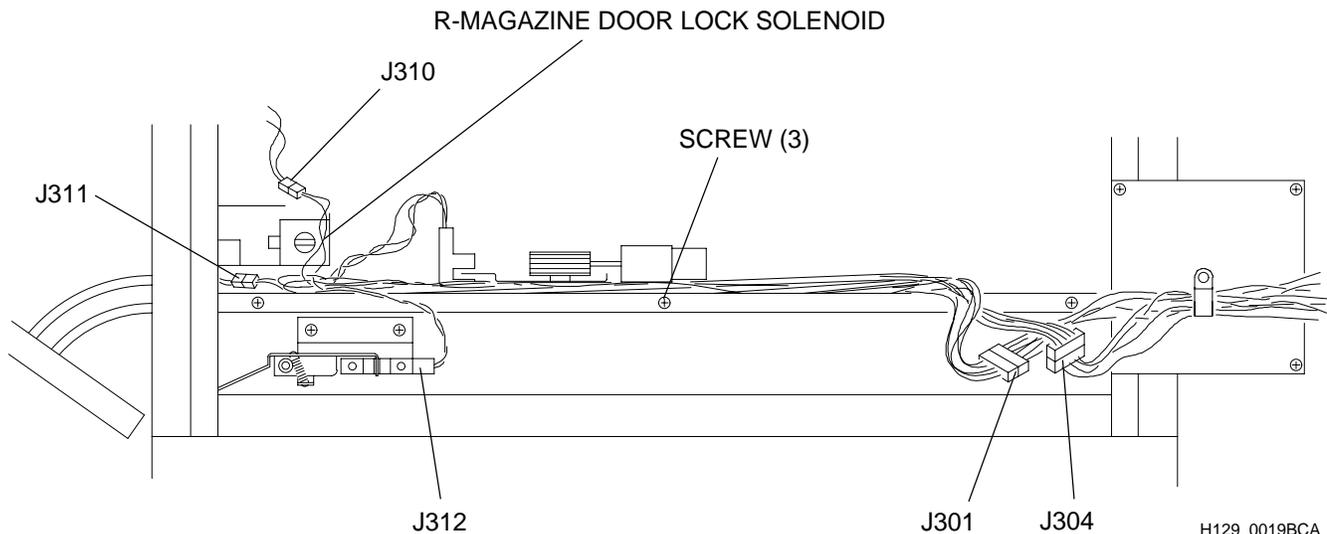
[5] Remove the 3 SCREWS.

[6] Lift the assembly a small amount and move it toward the right to remove it from the LASER PRINTER.



### Important

The assembly will contact the R-MAGAZINE DOOR LOCK SOLENOID if lifted too high.



H129\_0019BCA  
H129\_0019BC

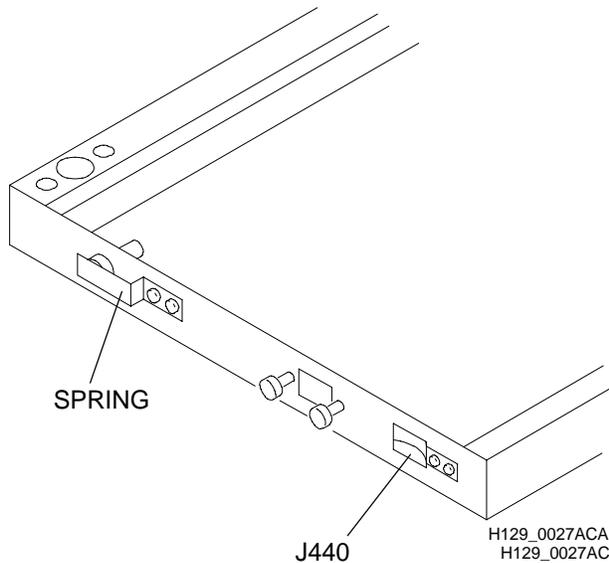
### Installation Notes:

The assembly must be in the closed position.

## R Magazine Storing Case

### Note

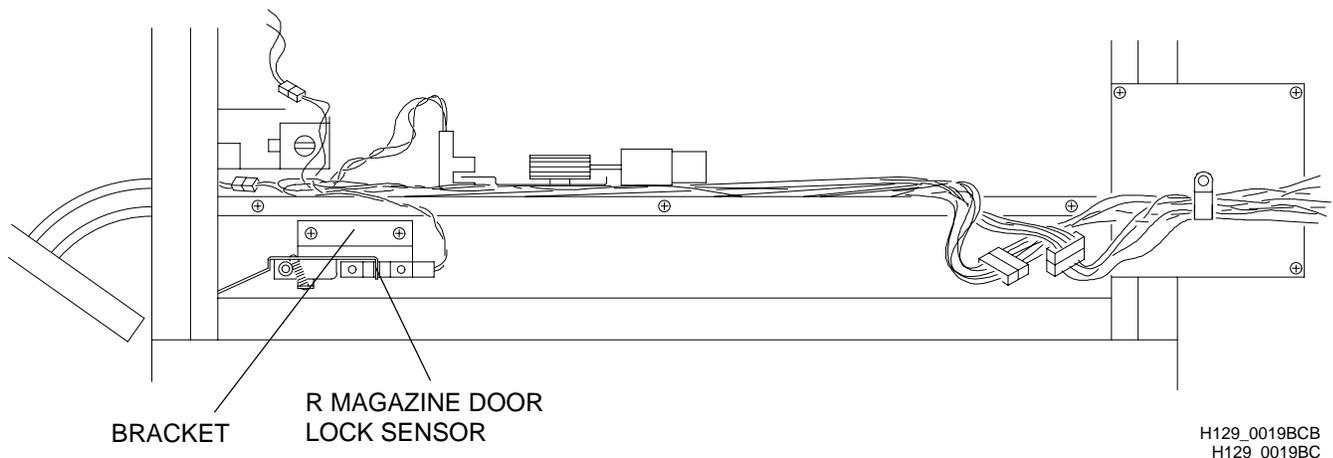
Use this procedure when replacing the SPRING.



### Warning

- Dangerous Voltage.
- Possible damage to eyes from invisible laser beam.
- Wear protective eyewear.
- Do not wear jewelry.

- [1] Do the removal procedures for the OUTLET GUIDE PLATE ASSEMBLY and RECEIVE MAGAZINE OPEN/CLOSE ASSEMBLY. See the procedures if necessary.
- [2] Disconnect the R MAGAZINE DETECTION SWITCH CONNECTOR J440.
- [3] Make a mark to show the location of the BRACKET.
- [4] Remove the BRACKET and 2 SCREWS of the R MAGAZINE DOOR LOCK SENSOR.

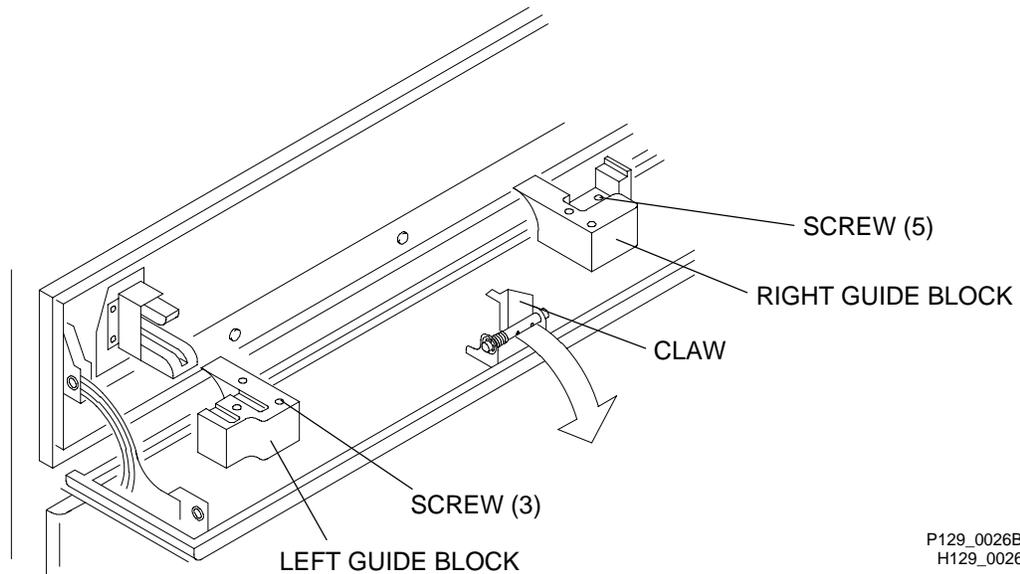




**Important**

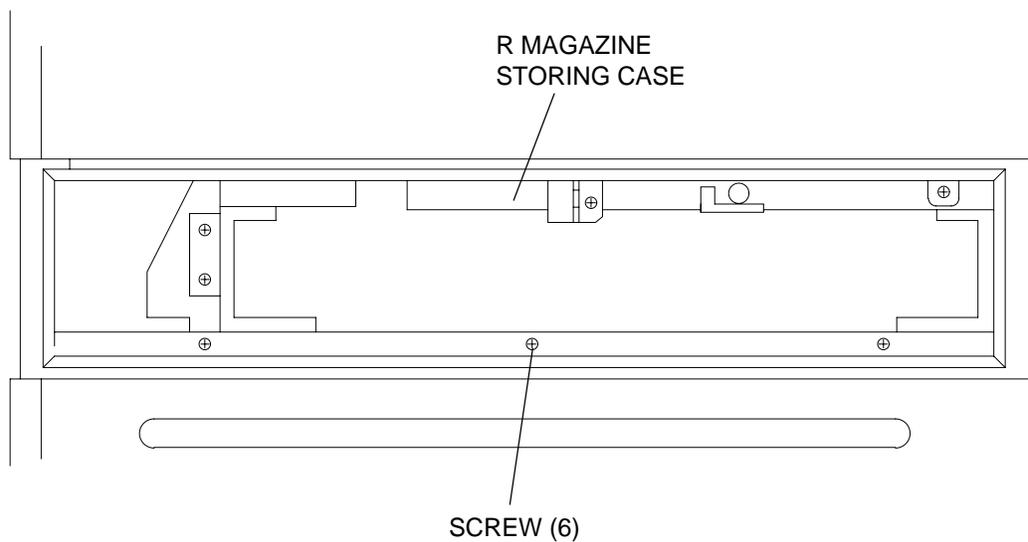
Keep the washers for each GUIDE BLOCK with that GUIDE BLOCK.

- [5] Remove the 5 SCREWS to remove the RIGHT GUIDE BLOCK.
- [6] Remove the 3 SCREWS to remove the LEFT GUIDE BLOCK.
- [7] Rotate the CLAW forward and fasten it to the COVER with TAPE.



P129\_0026BCA  
H129\_0026BC

- [8] Remove the 6 SCREWS.



H129\_0025BCA  
H129\_0025BC

- [9] Lift the R MAGAZINE STORING CASE and move it toward the front of the LASER PRINTER.

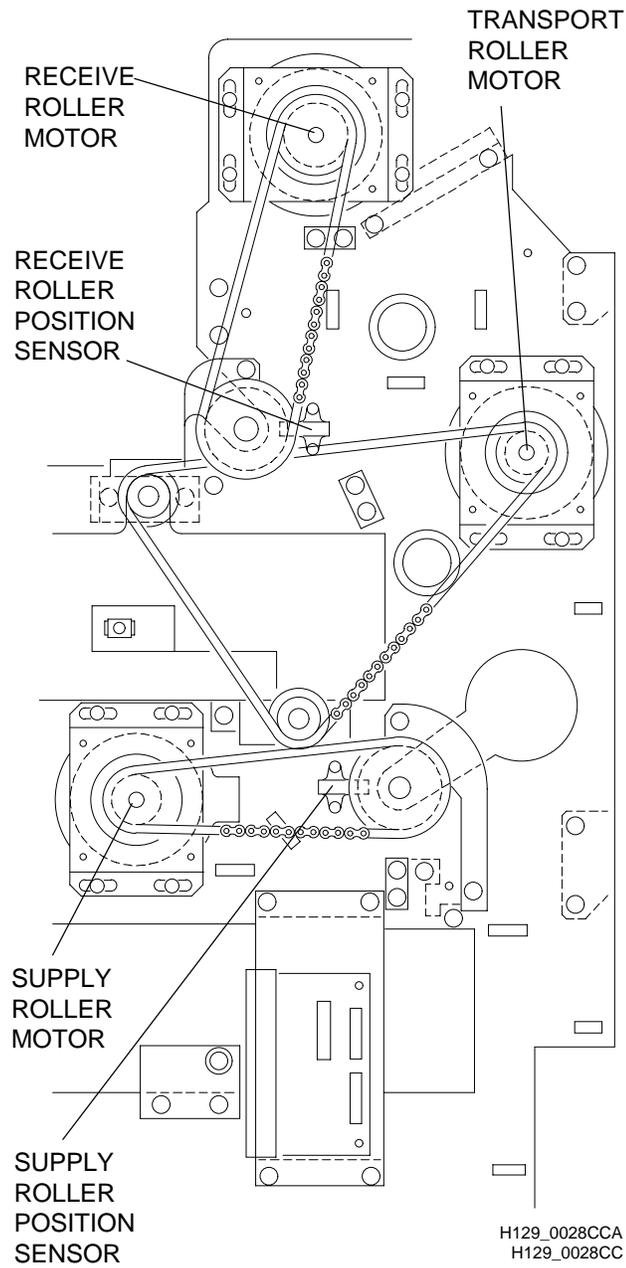


**Note**

Check that the bottom of the R MAGAZINE STORING CASE does not touch the TRANSPORT ROLLER.

## Locating Film Transportation Components

The following figure shows the location of all the Film Transportation Components:



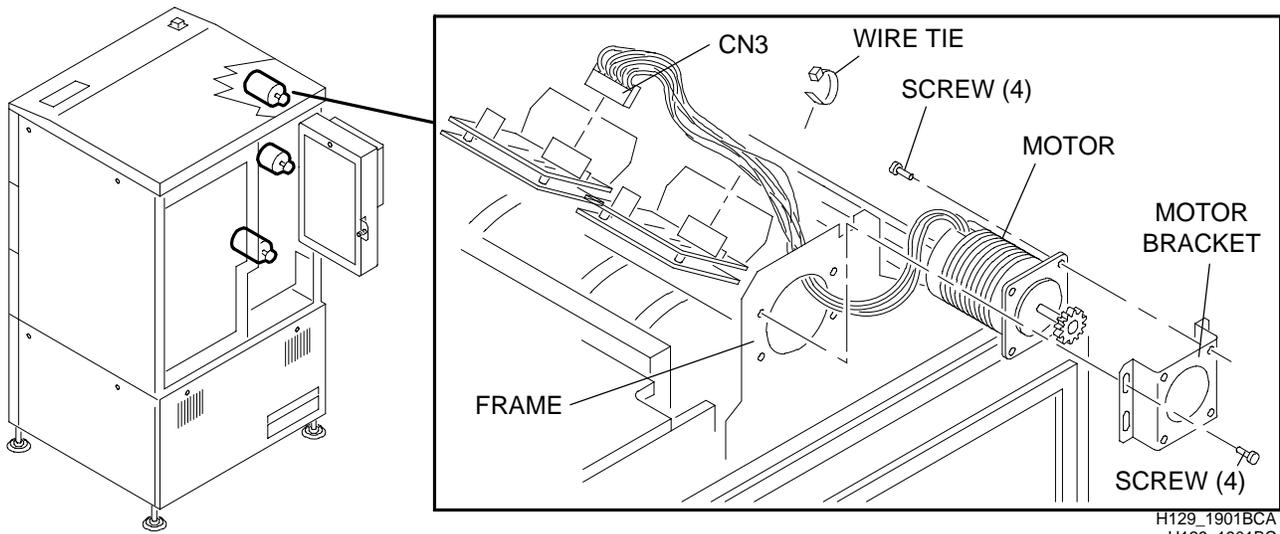
## Receive Roller Motor



### Warning

Dangerous Voltage. Possible damage to eyes from invisible laser beam.

- [1] De-energize the LASER PRINTER.
- [2] Remove the TOP COVER of the IMAGE UNIT. If necessary, see the procedure on Page 2-5.
- [3] Clip the WIRE TIES and disconnect CN3.
- [4] Remove the 4 SCREWS fastening the MOTOR BRACKET to the FRAME.
- [5] Remove the 4 SCREWS fastening the MOTOR to the MOTOR BRACKET.
- [6] Install WIRE TIES to prevent WIRES from contacting moving parts.



H129\_1901BCA  
H129\_1901BC

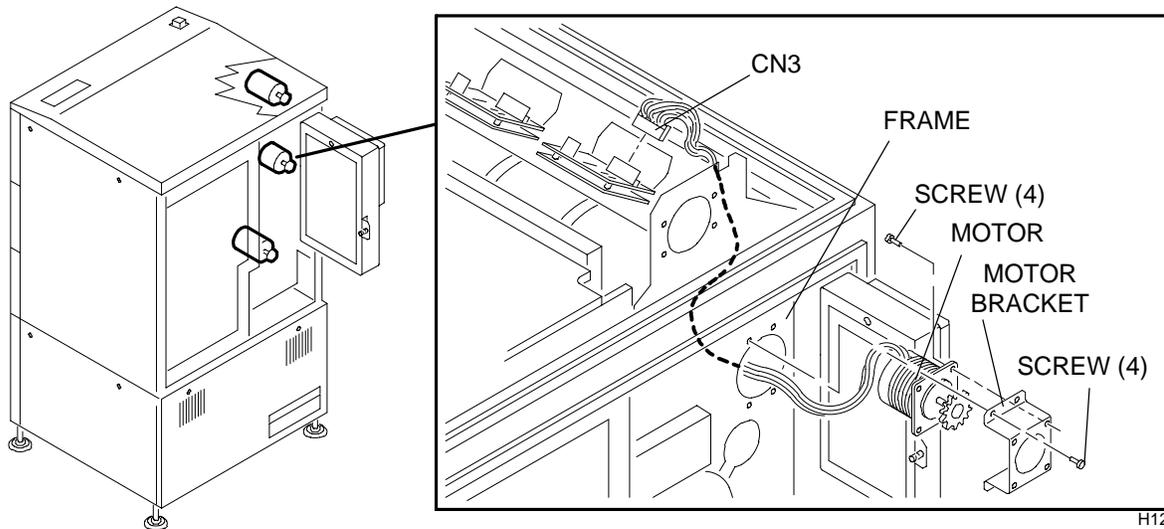
## Transport Roller Motor



### Warning

Dangerous Voltage. Possible damage to eyes from invisible laser beam.

- [1] De-energize the LASER PRINTER.
- [2] Remove the TOP COVER. If necessary, see the procedure on Page 2–5.
- [3] Disconnect CN3. Cut the WIRE TIES if necessary.
- [4] Remove the BACK IMAGE COVER. If necessary, see the procedure on Page 2–3.
- [5] Loosen the SCREW and open the FAN DOOR.
- [6] Remove the 4 SCREWS fastening the MOTOR BRACKET to the FRAME.
- [7] Remove the 4 SCREWS fastening the MOTOR to the MOTOR BRACKET.
- [8] Install WIRE TIES to prevent WIRES from contacting moving parts.



H129\_1902BCA  
H129\_1902BC

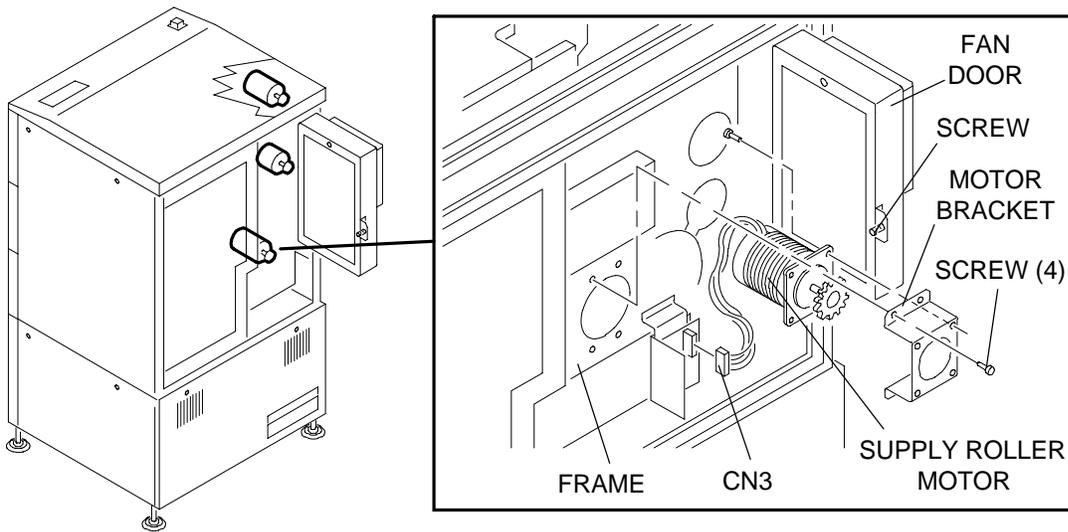
## Supply Roller Motor



### Warning

Dangerous Voltage. Possible damage to eyes from invisible laser beam.

- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2-3.
- [3] Loosen the SCREW and open the SLOW SCAN FAN ASSEMBLY DOOR.
- [4] Disconnect CN3.
- [5] Remove the 4 SCREWS fastening the MOTOR BRACKET to the FRAME.
- [6] Remove the 4 SCREWS fastening the MOTOR to the MOTOR BRACKET.



H129\_1903BCA  
H129\_1903BC

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## Section 3: Diagnostic Check Procedures

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### Table of Contents

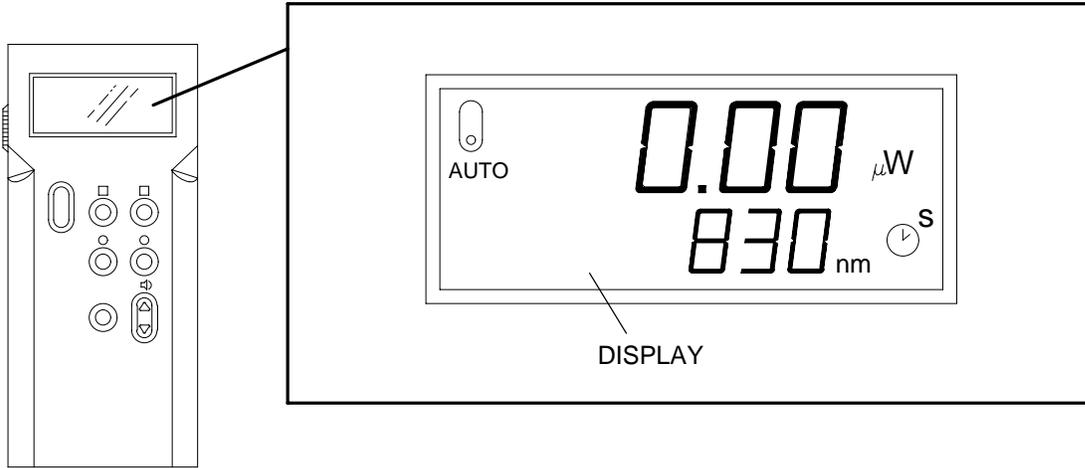
Description	Page
Setting up the Optical Power Meter . . . . .	3-2
Measuring the Laser Power . . . . .	3-4
Checking Vacuum Pressure . . . . .	3-10

## Setting up the Optical Power Meter

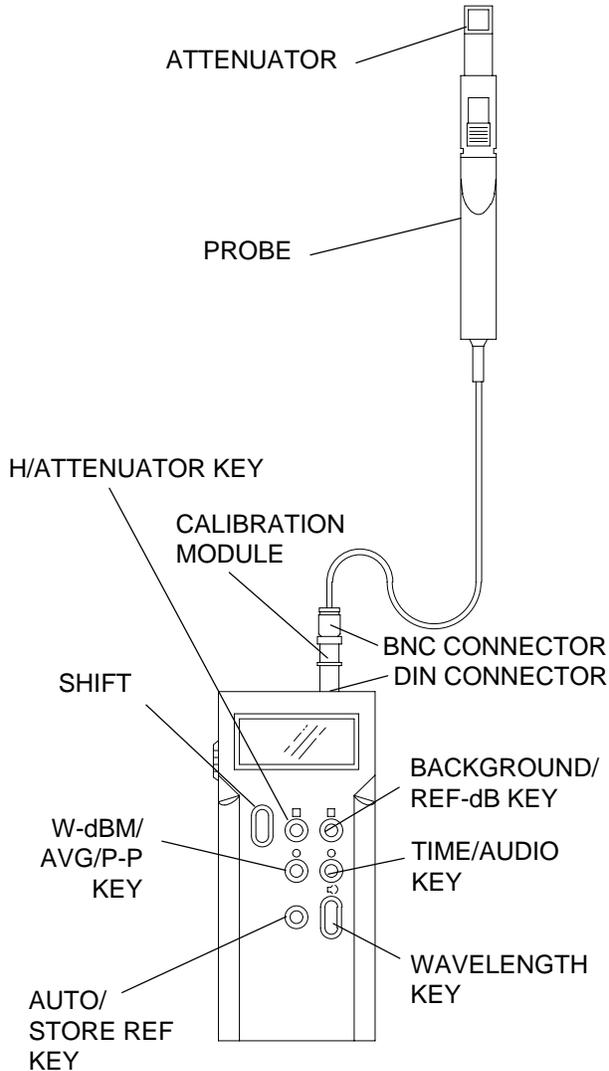
After setting up the Optical Power Meter, the meter should look like the illustration shown below.

 **Note**

The OPTICAL POWER METER function keys are set up to operate in 2 modes. The [SHIFT] key changes the function of each key. Shift functions are labeled in blue and normal functions are labeled in white on the meter panel. An icon appears on the meter for each function that has been selected.



H129\_0104BCA  
H129\_0104BC



H129\_0105CCA  
H129\_0105CC

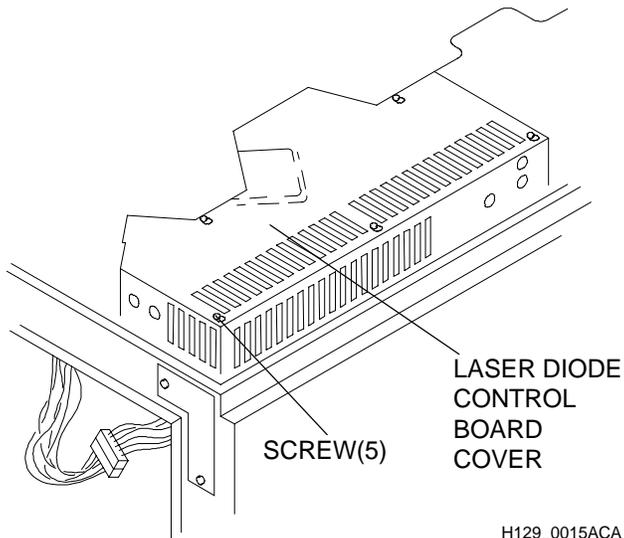
- [1] Connect the CALIBRATION MODULE to the BNC CONNECTOR on the OPTICAL METER PROBE.
  - [2] Insert the PROBE with the CALIBRATION MODULE into the OPTICAL METER input.
  - [3] Energize the OPTICAL POWER METER.
  - [4] Press the [SHIFT] key to return to normal function mode if the OPTICAL POWER METER is in the shift function mode.
  - [5] Press the [H] key to remove the "H" icon displayed on the meter.
  - [6] Press [SHIFT] and then press the [AUDIO] key to turn off the audio.
  - [7] Press the [STORE REF] key to turn off the RECALL.
  - [8] Press the [WAVE LENGTH] key to set the wavelength to 830 nm.
  - [9] Press the [ATTENUATOR] key to turn off the ATTENUATOR.
  - [10] Press the [SHIFT] and then press the [BACKGROUND] key to turn off the background.
  - [11] Press the [W-dBm] key exit dB mode.
  - [12] Press [SHIFT] and then press the [REF-dB] key to set the scale to  $\mu$  W.
  - [13] Press [AVG/P-P] to turn off the P-P measurement.
  - [14] Press the [SHIFT] key to restore functions to normal mode.
  - [15] Press the [AUTO] key.
- Note**  
"Auto" will be displayed on the meter.
- [16] Press the [TIME] key to set the time constant to S.
  - [17] Expose the probe ATTENUATOR.

## Measuring the Laser Power

If the film density appears to be out of specification and the processor and chemistry are functioning normally, use this procedure to check the laser power. Use this procedure to troubleshoot density variations by checking the original BEAM SPLITTER density value for D-MAX.

### Note

There are 2 styles of the LASER DIODE CONTROL BOARD. These BOARDS are STYLE A and STYLE B. STYLE B does not have a PORCH BOARD.



H129\_0015ACA  
H129\_0015AC

### Warning

- Dangerous Voltage.
- Possible damage to eyes from invisible laser beam.
- Wear protective eyewear.
- Do not wear jewelry.

- [1] Install the PORTABLE COMPUTER. See “Using the Portable Computer” in the Diagnostic Section.
- [2] Remove the TOP COVER. If necessary, see the procedure on Page 2–5.
- [3] Loosen the 5 SCREWS and remove the LASER DIODE CONTROL BOARD COVER.

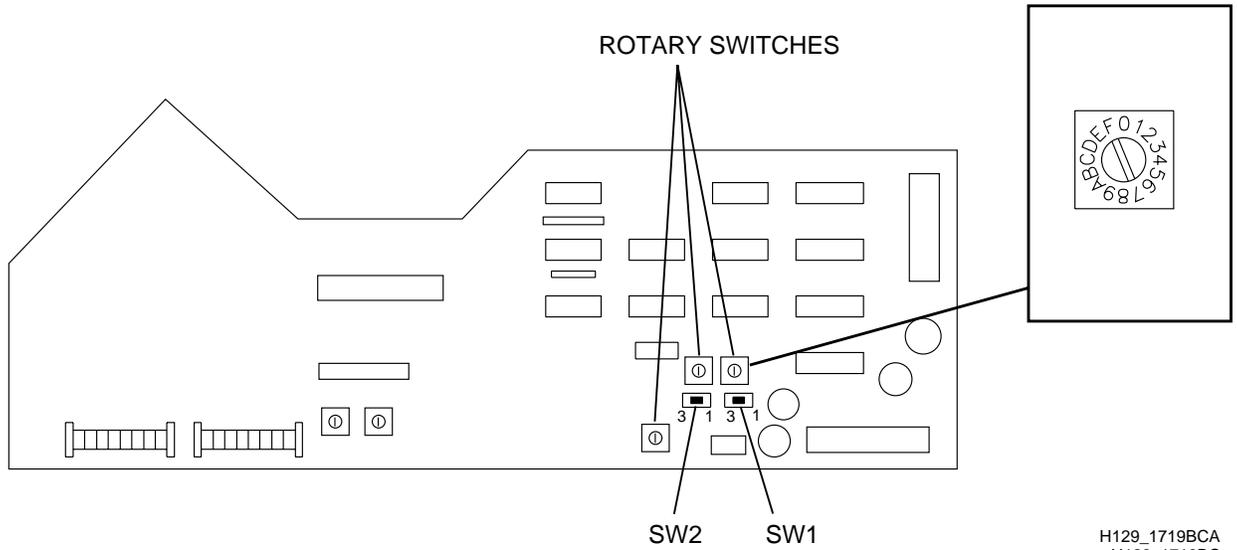
### Note

For the STYLE A LASER DIODE CONTROL BOARD, the ROTARY SWITCHES should be factory-set to F. This setting represents D-MAX.

- [4] For the STYLE A BOARD, if necessary, set the 3 ROTARY SWITCHES DSW1, DSW2 and DSW3 to F.
- [5] For the STYLE A BOARD, set SW1 and SW2 to position 3.

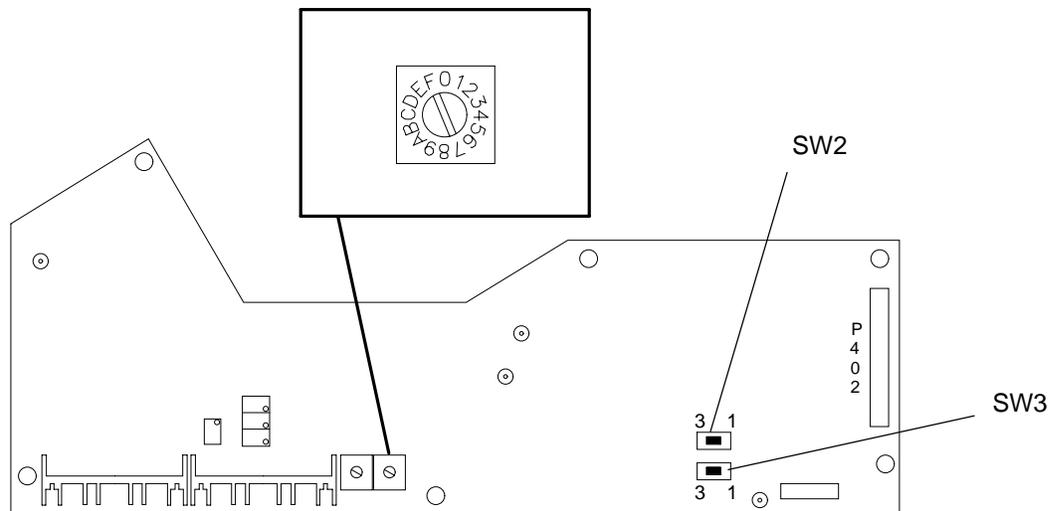
For the STYLE B BOARD, set SW2 and SW3 to position 3.

**Style A LASER DIODE CONTROL BOARD**



H129\_1719BCA  
H129\_1719BC

**Style B LASER DIODE CONTROL BOARD**



H129\_1728BCA  
H129\_1728BC

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag

Enter Menu Item:
    
```

- [6] Energize the LASER PRINTER.
- [7] Use the PORTABLE COMPUTER to display the CES Main Menu.

```

MONITOR MODE MENU

1 Motors           5 Sensors
2 Solenoids        6 Board Diag
3 Relay            7 Enter Commands
4 Miscellaneous    8 Set Beam-splitter

Enter Menu Item:
    
```

```

Input 'HLP' to know commands.

Enter command:
    
```

[8] Enter [1] for “Monitor Mode”.

[9] Enter [7] for “Enter Commands”.

 **Note**

- Commands must be entered using capital letters.
- See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.

**Style A**

```

Enter Command: LDO
    
```

[10] For the STYLE A BOARD, enter [L] [D] [O] to energize the laser.

For the STYLE B BOARD, enter [O] [L] [T], [1], and [4095].

**Style B**

```

Enter Command: OLT
Linear or constant (0/1) [0]:1
Look up table data (0 to 4095) [0]:4095
error=0
Enter command:
    
```

 **Important**

The BEAM SPLITTER must be reset to the original alignment value to measure laser power. If the alignment value was changed to meet customer needs, that value must be re-entered after the laser power measurement has been taken.

```

Enter Command: CBS
Density? (-3 to 3) [-3]:
    
```

[11] Enter [C] [B] [S] to set the BEAM SPLITTER density settings.

```

Enter Command: CBS
Density? (-3 to 3) [-3]:0
Current Density: 0
    
```

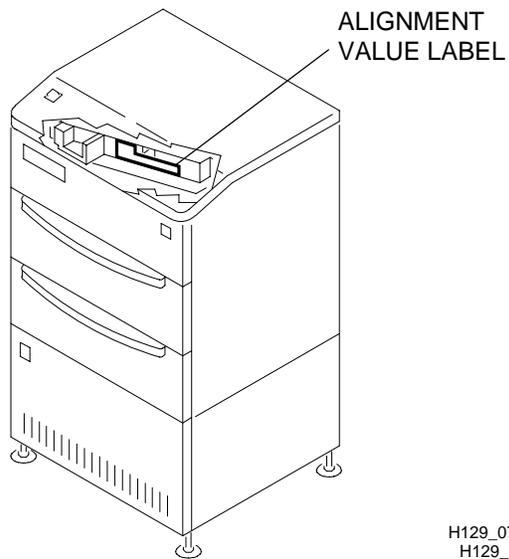
[12] Enter [0] for density setting 0.

```

error=0
Enter Command: SET
Density? (-3 to 3) [-3]:0
Old pulse number: XXX
Pulse number[B]? (0 to 200):XXX
    
```

[13] Enter [S] [E] [T].

[14] Enter [0].

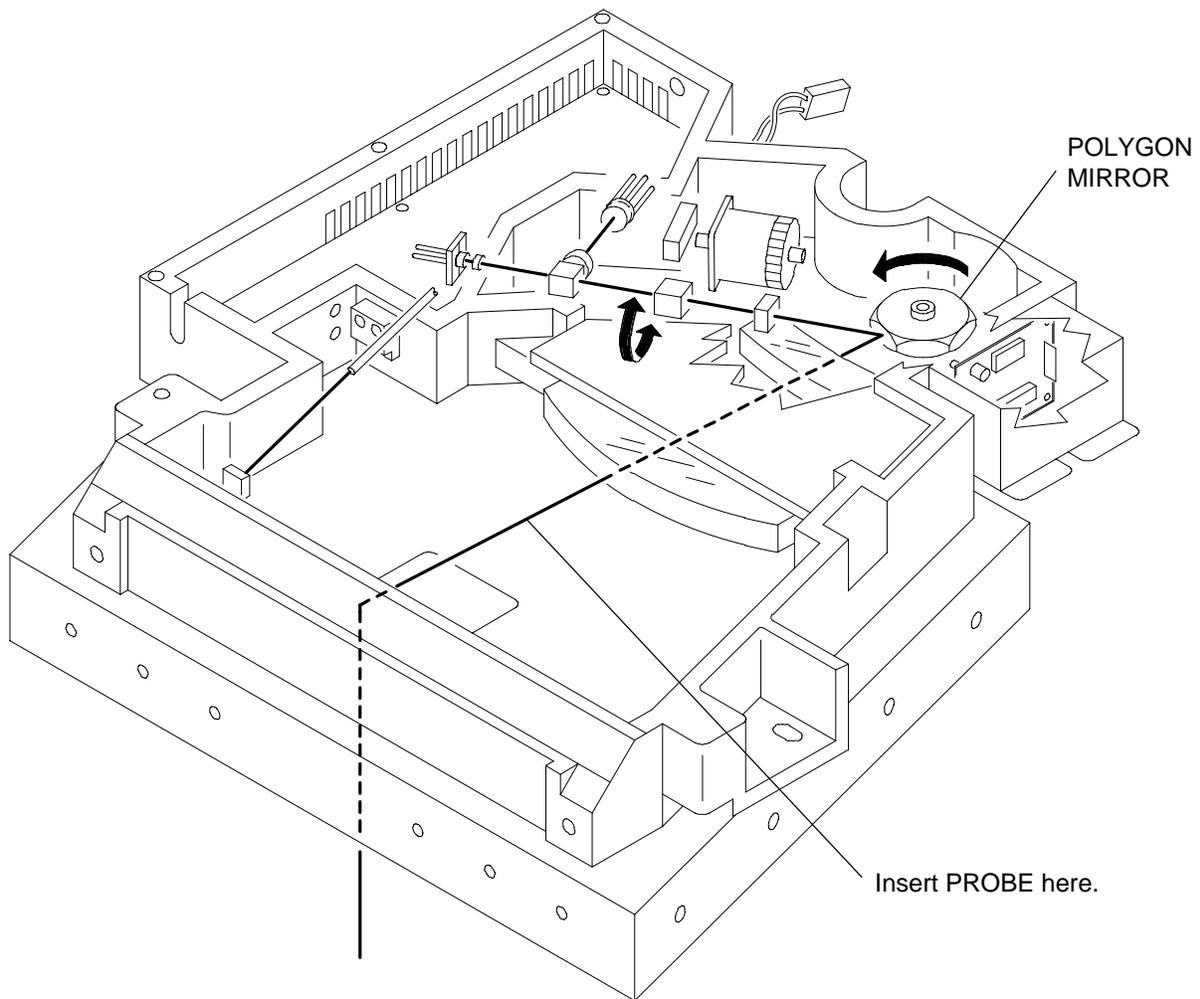


H129\_0708ACA  
H129\_0708AC

```
Old pulse number: XXX
Pulse number? (0 - 200): (table number)
Pulse number? (0 - 200):
```

```
Density 0=XXX pulses
error=0
Enter Command:
```

- [15]** Compare the pulse count values displayed on the PORTABLE COMPUTER with the values on the ALIGNMENT VALUE LABEL.
- (a) Check the old pulse number for density setting 0 displayed on the PORTABLE COMPUTER.
  - (b) Check the pulse number for the density setting 0 value on the ALIGNMENT VALUE LABEL located on the front of the OPTICAL UNIT.
- [16]** If the pulse number for density setting 0 value displayed on the PORTABLE COMPUTER is different than the setting 0 value on the ALIGNMENT VALUE LABEL:
- (a) record the value displayed on the PORTABLE COMPUTER to be re-entered later
  - (b) enter the label value at the “How many pulses?” prompt and press the [ENTER]key again.



H129\_2900DCC  
H129\_2900DC

[17] Check that the laser is energized. Use a PHOSPHOR PROBE TL-2579 to locate the laser beam.



**Important**

Do not touch the POLYGON MIRROR.

[18] If necessary, use a pencil tip to rotate the POLYGON MIRROR to locate the laser beam.

[19] Set up the OPTICAL POWER METER. See the procedure on Page 3-2 if necessary.



### Important

The laser power measurement obtained in the following step should be  $1.49 \text{ mW} \pm .10 \text{ mW}$ . Call TAC if this value is not obtained.

[20] Insert the OPTICAL POWER METER PROBE in the laser beam path, and move the probe until the value displayed on the METER is maximum.

[21] Record the maximum power value on the ALIGNMENT VALUE LABEL.

```
error=0
Enter Command: LDF
```

[22] For STYLE A BOARD, enter [L] [D] [F] to turn off the Laser Diode.

```
error=0
Enter Command: SET
Density? (-3 to 3)[-3]:0
Old pulse number: XXX
```

[23] For STYLE A BOARD, reset SW1 and SW2 to position 1.

For STYLE B BOARD, reset SW2 and SW3 to position 1.

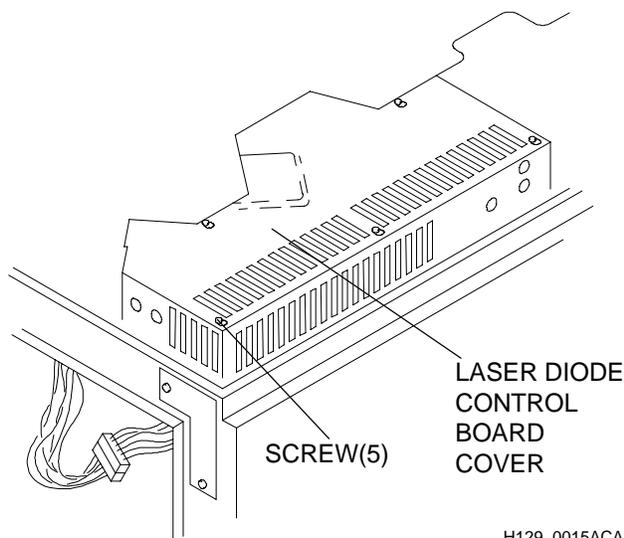
[24] Enter [S] [E] [T].

[25] Enter [0].

[26] Enter the pulse number recorded in Step .

[27] Press [ESC] 3 times to exit diagnostics.

[28] Install the LASER DIODE CONTROL BOARD COVER.

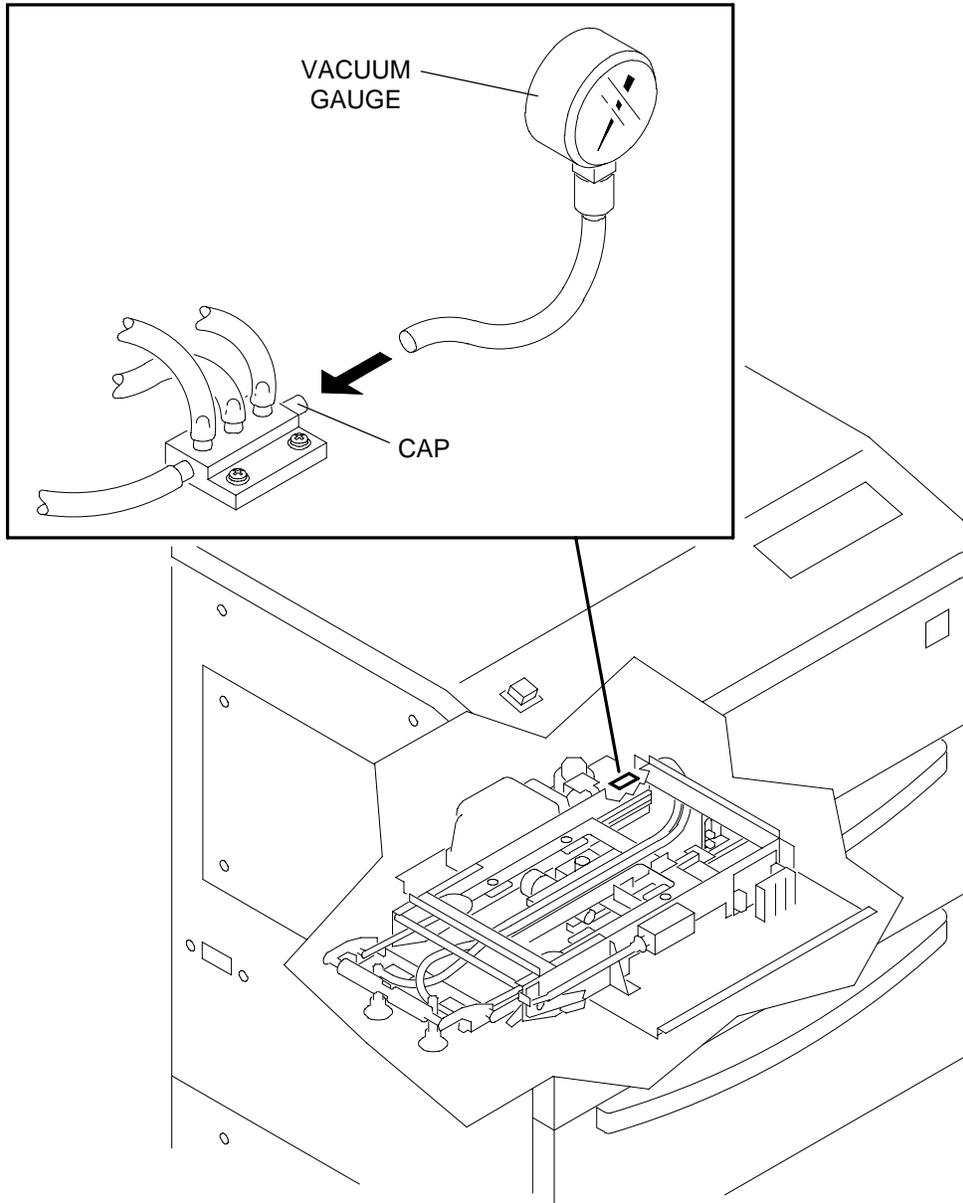


H129\_0015ACA  
H129\_0015AC

## Checking Vacuum Pressure

Use this procedure to troubleshoot film transport problems related to film suction.

- [1] Install the PORTABLE COMPUTER. See “Using the Portable Computer” in the Diagnostic Section.
- [2] Remove the RIGHT IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [3] Remove the CAP.
- [4] Install the VACUUM GAUGE TL-4586.
- [5] Energize the LASER PRINTER.
- [6] Load exposed film into the SUPPLY MAGAZINE.



H129\_0103DCA  
H129\_0103DC

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs       5 Debug Utility
3 Boards Diag
Enter Menu Item:
    
```

[7] Use the PORTABLE COMPUTER to display the CES Main Menu.

```

MONITOR MODE MENU
1 Motors            5 Sensors
2 Solenoids         6 Board Diag
3 Relay             7 Enter Commands
4 Miscellaneous     8 Set Beam-splitter
Enter Menu Item:
    
```

[8] Enter [1] for "Monitor Mode".

```

Input 'HLP' to know commands.
Enter command:
    
```

[9] Enter [7] for "Enter Commands".

```

Enter Command: MGO
error=0
    
```

 **Note**

- Commands must be entered using capital letters.
- See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.

```

Enter Command: ITR
error=0
    
```

[10] Enter [M] [G] [O] to open the SUPPLY MAGAZINE WINDOW.

```

Enter Command: FDA
Film size? (0-3):
    
```

[11] Enter [I] [T] [R] to place the TRANSPORT ROLLERS in the initial position.

```

Film size? (0-3): X
Default parameters or set again?0 or 1:
    
```

[12] Enter [F] [D] [A] to lower the SUCKER ASSEMBLY to lift a sheet of film.

[13] Enter the correct number corresponding to the size of the film loaded into the SUPPLY MAGAZINE.

- 0: 8x10
- 1: 11x14
- 2: 35x35
- 3: 35x43

```

Default parameters or set again?0 or 1:
error=0
Enter command:
    
```

[14] Press [Enter] for default.

[15] Read the pressure on the VACUUM GAUGE.

- (a) The pressure should be between 310 mm Hg and 330 mm Hg (between 10 in. and 13 in. Hg.)

(b) If the pressure is not correct, check the frequency of the ELECTRONIC PUMP. See the procedure on Page 5-4.

**Note**

The following steps are provided to complete the film transport cycle.

Enter command:FDB

[16] Enter [F] [D] [B] to move the film to the SUPPLY ROLLER.

Enter command:TRS  
Film size? (0-3):

[17] Enter [T] [R] [S] to transport the film to the RECEIVE ROLLER.

Film size? (0-3):X  
Continue or step? (0 or 1):

[18] Enter the correct number corresponding to the size of the film loaded in the SUPPLY MAGAZINE.

- 0: 8x10
- 1: 11x14
- 2: 35x35
- 3: 35x43

Continue or step? (0 or 1): 0  
Default parameters or set again? (0 or 1):

[19] Enter [0] to continue.

Default parameters or set again? (0 or 1):0  
error=0

[20] Press [Enter] for defaults.

Enter command:PON

[21] Enter [P] [O] [N] to energize the POLYGON MOTOR.

Enter command:PRI  
Caution! Laser will be turned on.  
Polygon ready, yes or no? (0 or 1):

[22] Enter [P] [R] [I] to print an image.

Polygon ready, yes or no? (0 or 1): 0  
Film size? (0-3):

[23] Enter [0] for yes.

Film size? (0-3):X  
Default parameters or set again? (0 or 1):

[24] Enter the correct number corresponding to the size of the film loaded in the SUPPLY MAGAZINE.

- 0: 8x10
- 1: 11x14
- 2: 35x35
- 3: 35x43

Default parameters or set again? (0 or 1):0  
error=0

[25] Press [Enter] for defaults.

```
error=0
Enter command: REC
Film size? (0-3):
```

```
Film size? (0-3):X
```

**[26]** Enter [R] [E] [C] to move the film to the RECEIVE MAGAZINE.

**[27]** Enter the correct number corresponding to the size of the film loaded into the SUPPLY MAGAZINE.

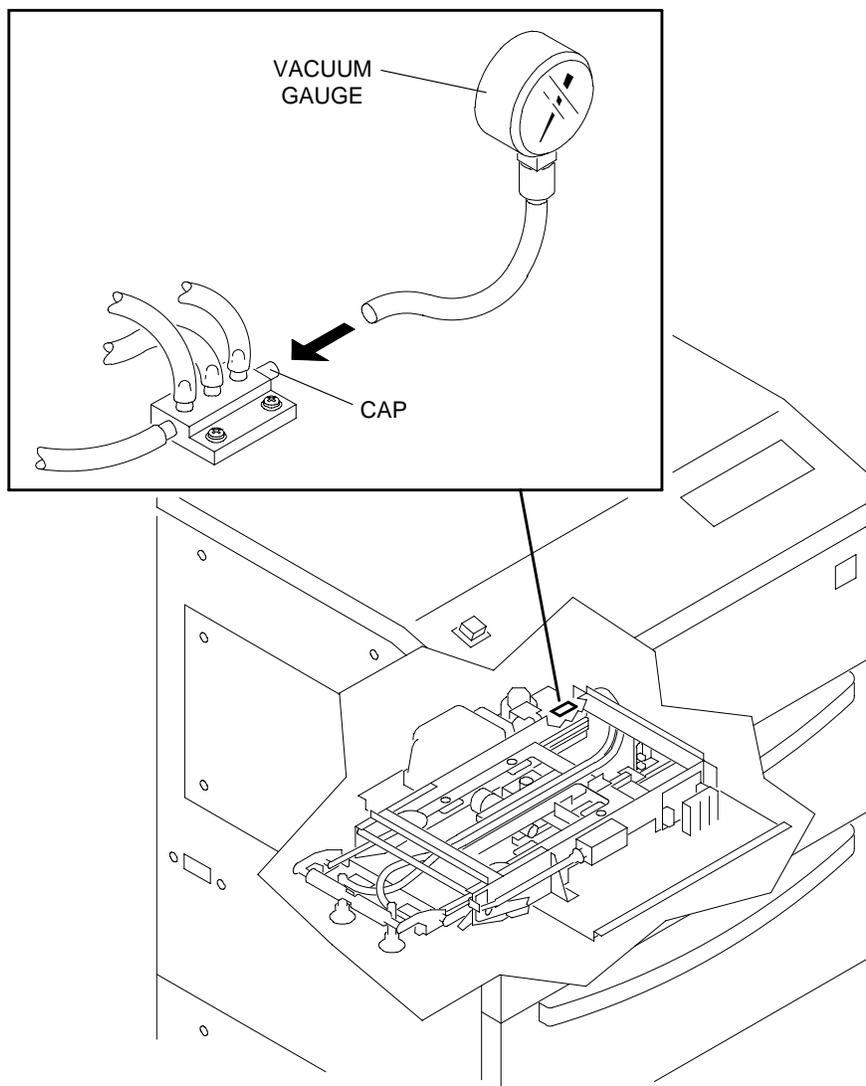
- 0: 8x10
- 1: 11x14
- 2: 35x35
- 3: 35x43

**[28]** Press [ESC] 3 times to exit diagnostics.

**[29]** Remove the VACUUM GAUGE.

**[30]** Install the CAP.

**[31]** Install the RIGHT IMAGE UNIT COVER.



H129\_0103DCA  
H129\_0103DC



---

## Section 4: Operation Adjustments

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## Calibration

---

### Overview

Calibration is a method of ensuring consistent image appearance despite differences in film emulsions and variations in the chemistry for the processor. Calibration also provides consistent filmed images regardless of which PRINTER or processor is used.

The LASER PRINTER can store 11 calibration settings. When the PRINTER is taken off-line, the CONTROL PANEL displays the calibration number of the previous calibration.

The user calibrates at any time and stores and prints images during calibration. If the user calibrates while the LASER PRINTER is printing, the new calibration takes effect only when all copies of the current page are printed.

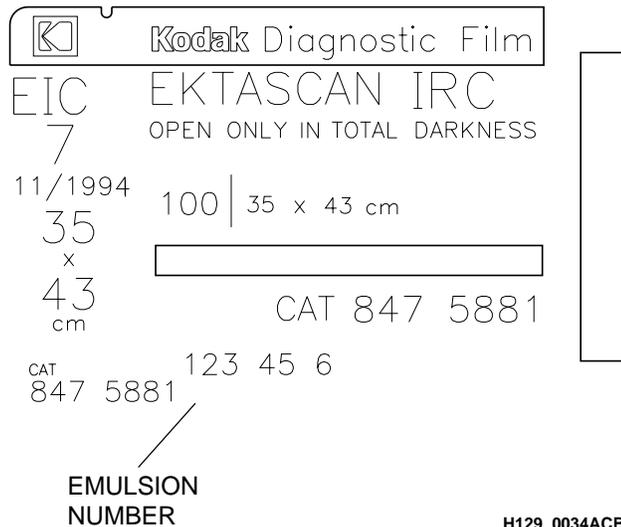
## When to Calibrate

In general, the LASER PRINTER provides consistent output. For optimal quality assurance, however, it is suggested that the LASER PRINTER be calibrated when you change:

- the film emulsion
- the processing environment--for example, the chemistry or temperature of the processor
- the density setting
- the battery on the SEQUENCE BOARD
- the SEQUENCE BOARD.

### Note

To determine if the emulsion number has changed, locate the label on the side of the box of film.



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H129\_0034AA

## Calibrating the Printer

The PRINTER can store up to 11 sets of 9 density values under Calibration numbers 1-11.



### Important

- Use this procedure to set new density values and to store those values under a calibration number 1-11.
- To check and select previously stored density values under calibration number 1-11, see “Checking Stored Calibration Settings” on Page 4–11.

[1] Check that the LASER PRINTER and the processor are warmed up.



### Note

The CONTROL PANEL displays the message [00 PRINTER READY].

1. CALIBRATION #

1A SET DENSITY

-3 -2 -1 0 +1 +2 +3

[2] Press the [On Line] key.

[3] Press the [▼] and [▲] keys to change the calibration number.

[4] Press the [SELECT] key.

[5] Press the [SELECT] key.



### Important

The default value is 0, density setting 0. Changing the value from 0 will increase or decrease D-MAX by a density factor of 0.10 for each increment. Example: entering -2 would change a D-MAX value previously set at 2.8 to 2.6.



### Caution

All previously entered data under the calibration number selected will be lost.

[6] Press the [▼] and [▲] keys to move the cursor to the desired value.

[7] Press the [SELECT] key.

[8] Press the [SELECT] key.

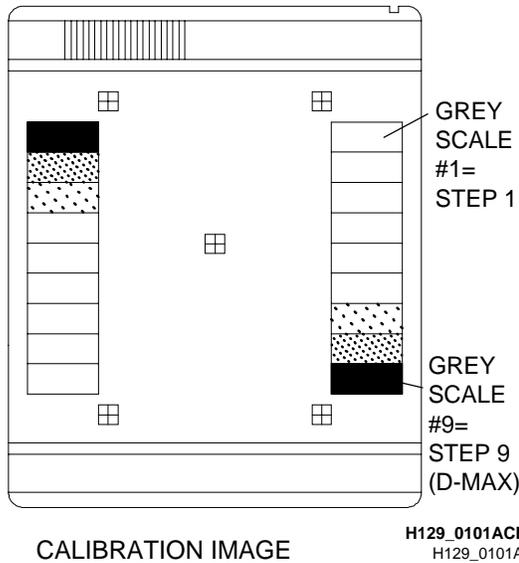
-3 -2 -1 0 +1 +2 +3

1B PRINT CAL IMAGE

PRINTING CAL IMAGE

C: ENTER DATA

### Old-Type Calibration Image

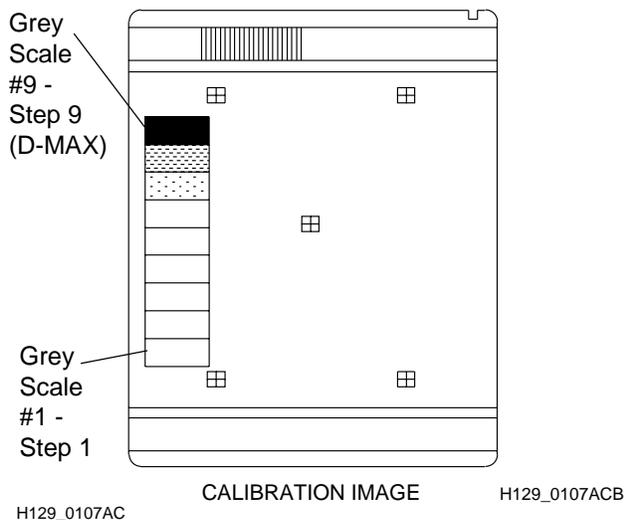


- [9] Press the MAGAZINE DOOR OPEN/CLOSE SWITCH.
- [10] Open the RECEIVE MAGAZINE DOOR.
- [11] Remove the RECEIVE MAGAZINE.
- [12] Process the Calibration Image. Use the same processor that will be used to process film printed by the LASER PRINTER.

**Note**

If you have installed Modification 5 for the Laser Printer, the printer will produce a new type of calibration image. Look at the illustration at right to determine which type of calibration image you have.

### New-Type Calibration Image



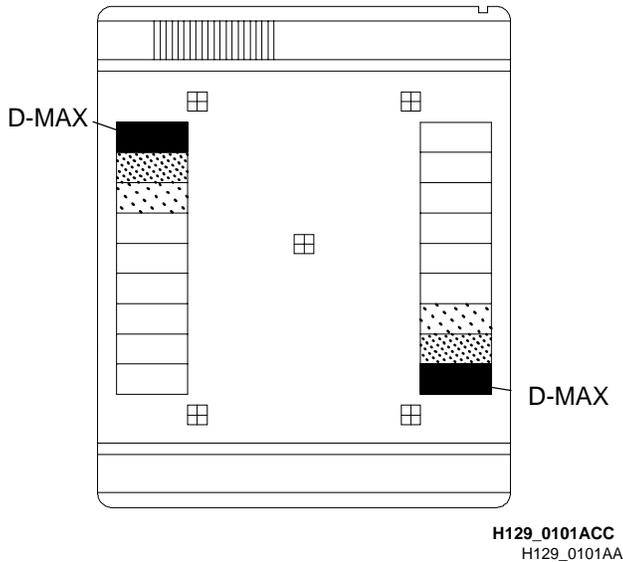
- [13] Use a DENSITOMETER to check the maximum density of the Calibration Image.
  - (a) If the density of the darkest step is too light, do Steps 2 through 13 again, changing the density to a higher setting.
  - (b) If the density of the darkest step is too dark, do Steps 2 through 13 again, changing the density to a lower setting.
  - (c) If the density settings do not provide enough range to meet customer needs, see “Setting Film Density - Beam Splitter Pulse Settings” on Page 4–16.
- [14] Advance to “Measuring and Entering Density Data” on Page 4–6.

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## Measuring and Entering Density Data

### Using a Stand-alone DENSITOMETER

#### Old-Type Calibration Image



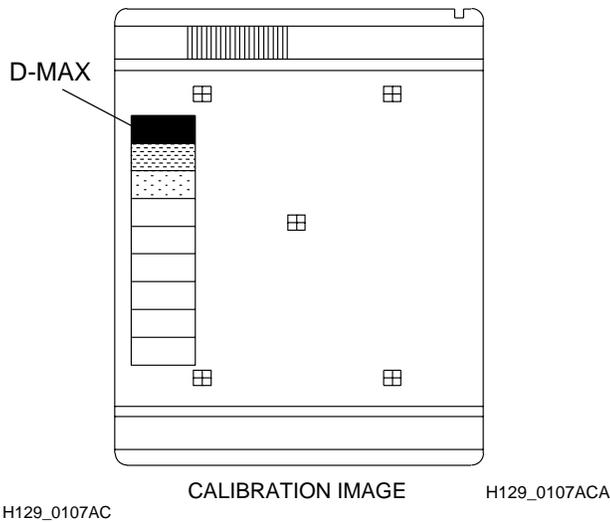
Use the following method to measure and enter the density data.

- [1] Prepare a stand-alone DENSITOMETER for use.
- [2] Measure the density at the center of each gray step on the Calibration Image.
  - (a) Check that the notch on the edge of the film is at the upper right corner for 35 x 43 cm, 35 x 35 cm, and 8 x 10 in. For 11 x 14 in., the notch should be at the lower right corner.
  - (b) Read the 9 gray steps on the calibration image.

#### Note

If you have an “old-type” calibration image, read either side strip of 9 gray steps, but read all the steps from the same side.

#### New-Type Calibration Image



- [3] Record the data.
- [4] Press [SELECT] on the CONTROL PANEL to display the screen for the first gray step value.

ENTER STEP 1: x.xx

- [5] To change the density value for a step,
  - (a) press the [▼] key on the CONTROL PANEL to decrease the density value.
  - (b) press the [▲] key on the CONTROL PANEL to increase the density value, or

#### Note

The minimum density value that can be entered is 0.00, and the maximum density is 3.99.

- [6] Press [NEXT] to enter the density value and display the next density step.
- [7] Do Steps 5 and 6 for gray steps 2 through 9, sequentially.

1D BEGIN CALIBRATION

[8] Check the density values by pressing [NEXT] and reviewing each of the 9 density values.

[9] Press [SELECT].

CALIBRATING

[10] Press [SELECT] again to begin the calibration.

### Note

- The PRINTER will compute the calibration table. Calibration will take about one minute. When the calibration has been calculated successfully, the LASER PRINTER displays:  
[ 00 PRINTER READY ].
- If calibration is not successful, the CONTROL PANEL will display error 54. See the Calibration Errors procedure below.

---

## Calibration Errors

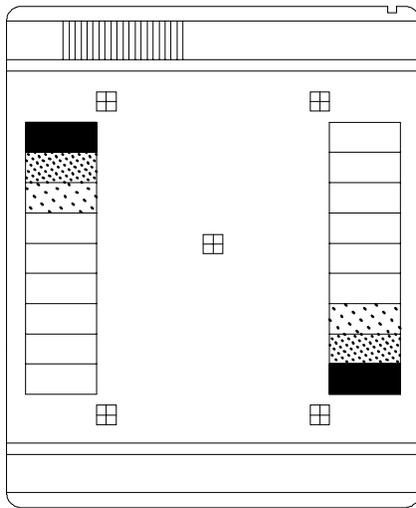
If calibration is unsuccessful, the LASER PRINTER displays an error message.

54 ERROR:  
CALIBRATION

[1] Check that the LASER PRINTER and the processor are warmed up completely.

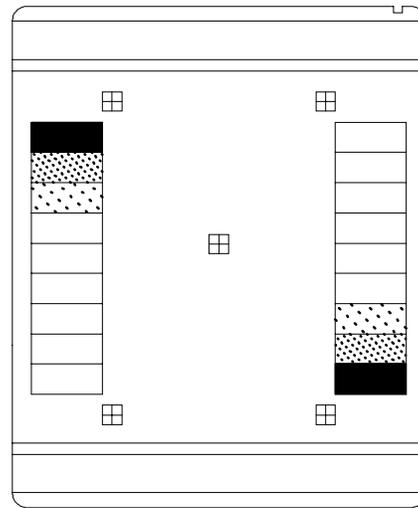
[2] Check that the Calibration Image was used and not the Test Image.

### Old-Type Calibration and Test Images



CALIBRATION IMAGE

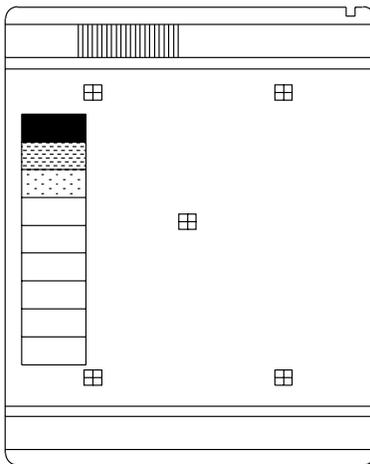
H129\_0101ACD  
H129\_0101AA



TEST IMAGE

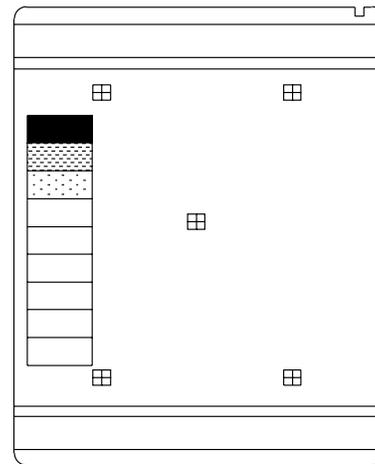
H129\_0100ACA  
H129\_0100AA

### New-Type Calibration and Test Images



CALIBRATION IMAGE

H129\_0107AC



TEST IMAGE

H129\_0108AC

[3] If the Test Image was used, do the procedure Calibrating the Printer beginning on Page 4-4.



### Important

The density of each step must be greater than or equal to the density of the previous step.

[4] Check that the DENSITOMETER is calibrated correctly.

[5] If calibration is still unsuccessful, call TAC.

---

**Using the *Kodak* Process Control DENSITOMETER as a Stand-alone DENSITOMETER**

CH:I (lab identifier) CH:I go
-------------------------------

The *Kodak* PROCESS CONTROL DENSITOMETER can also be used to read the 9 density values. To do so, use the following procedure:

- [1] Prepare the DENSITOMETER for use.
- [2] After passing the self-test, the DENSITOMETER will display:
- [3] Simultaneously press [MENU] and [MENU].
- [4] Position the film tightly up to the Stop of the DENSITOMETER, then insert the film until it rests against the drive rollers and the motor is activated.

** Note**

Always read the densities with the emulsion side of the film facing up. The notch should be in the upper right hand corner.

- [5] While the film is measured, hold the film against the Stop, guiding the film to prevent skewing.
- [6] Press the right-side [MENU] key that is under the displayed word “go”.
- [7] Press the right-side [MENU] key again when the DENSITOMETER displays “go”.

CH:I	SD.Indx = x.xx
P1	CIndx = x.xx

CH:I	Temp F = xx.x
P4	Den #01 = x.xx

[8] Press the left-side [CHAN] key under the “P1” three times when the DENSITOMETER displays the screen at the right, with a “P1” at the bottom left corner.

 **Note**

The third time the [CHAN] key is pressed, the DENSITOMETER will display:

 **Important**

The DENSITOMETER is ready to display the densities for all 21 steps that it has read from the Calibration Image. The *Kodak Ektascan 1120 LASER PRINTER* uses only the densities of steps 7 through 15. To read and record the required densities:

[9] Press the right-side [CHAN] key and scroll through the densities.

[10] Record the values when of density steps 7 through 15.

[11] Check the values by scrolling through density steps 7 through 15 again.

[12] Simultaneously press [MENU] and [MENU].

 **Note**

The PORTABLE COMPUTER will display the Main Menu.

[13] Enter the values as described in the procedure “Using a Stand-alone DENSITOMETER” beginning in Step 4 on Page 4–6.

## Checking Stored Calibration Settings

1. CALIBRATION #: X

1A SET DENSITY

-3 -2 -1 0 +1 +2 +3

1B PRINTING CAL IMAGE

1C ENTER DATA

1. CALIBRATION #: X

ENTER STEP 1: X

ENTER STEP 9: X

1D BEGIN CALIBRATION

CALIBRATING

00 PRINTER READY

- [1] Press [ON-LINE].
- [2] Press [▼] and [▲] keys to select the desired calibration number.
- [3] Press [SELECT].
- [4] Press [SELECT].
- [5] Check that the stored density is underscored.

### Note

If the stored density is not underscored, a new calibration must be done. See Calibrating the Printer on Page 4–4.

- [6] Press [SELECT].
- [7] Press [NEXT].
- [8] Press [SELECT].
- [9] Wait one minute for the PRINTER to compute the calibration table.
- [10] Press and release [NEXT] to check each of the density values.
- [11] Press [SELECT].
- [12] Press [SELECT].

## Recovering from a Calibration Error

Perform this procedure if you receive a calibration error when energizing the 1120 Laser Printer.



### Important

When the printer displays “54 ERROR:CALIBRATION,” you must perform this procedure before you can enter off-line mode to calibrate the printer.

- [1] Enter CES Hidden Mode.
- [2] Press [Next] to step through the options until “RAW DATA x:y.yy” is displayed.
- [3] Enter the following 9 raw data values:
  1. 0.15
  2. 0.22
  3. 0.42
  4. 0.79
  5. 1.25
  6. 1.73
  7. 2.12
  8. 2.46
  9. 2.71
- [4] Press [Next] until “CAL DATA: xxxx” is displayed.



### Note

At this point, you can set CAL DATA to either “NORMAL” or “OK”.

Setting CAL DATA to “NORMAL”	Setting CAL DATA to “OK”
<ol style="list-style-type: none"> <li>1. Set CAL DATA to “NORMAL”.</li> <li>2. Exit from CES HIDDEN MODE. The printer displays “09 CALIBRATE PRINTER”.</li> <li>3. Enter off-line mode.</li> <li>4. Calibrate the printer.</li> </ol> <p> <b>Note</b> After calibrating, the value for CAL DATA in HIDDEN MODE changes to “OK”.</p>	<ol style="list-style-type: none"> <li>1. Set CAL DATA to “OK”.</li> <li>2. Exit from CES HIDDEN MODE.</li> </ol> <p> <b>Note</b> The printer displays “07 PRINTER WARM UP”</p> <p> <b>Important</b> When you set CAL DATA to “OK”, the printer calibrates itself. You can continue to use the printer, but you should enter off-line mode and perform a manual calibration as soon as possible to ensure maximum image quality.</p>

---

## Tone Scaling



### Important

- Before doing a Tone Scale adjustment, check that the Imaging Device Monitor has been correctly adjusted. This Monitor adjustment should not be changed once the Tone Scaling has been completed.
- Tone Scale adjustments should only be done by trained personnel.

Tone Scaling is a technique of making printed images match the images on the input monitor. To adjust the tone scale, use the following procedure:

- [1] Check that the Density is set for the desired maximum density using the Setup Procedure beginning on Page 4–22.
- [2] Calibrate the PRINTER using the Calibration Procedure on Page 4–4.
- [3] Use the Keypad [Program] key to adjust the Curve Shape. If necessary, see the User Manual, 5B9622.
- [4] Use the Keypad [Program] key to adjust the Contrast. If necessary, see the User Manual, 5B9622.

## Checking Film Transport

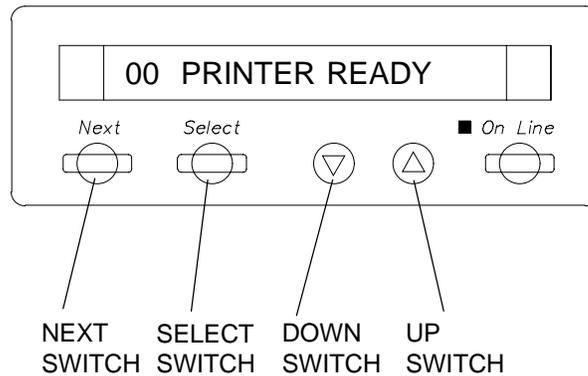
### ➤ Note

- Use exposed film for this procedure.
- Use the service key to allow operation of the PRINTER with the doors open.

[1] Check that the LASER PRINTER and the processor are warmed up.

### ➤ Note

The CONTROL PANEL will display the message [07 PRINTER WARM-UP] followed by [00 PRINTER READY].



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### ➤ Note

The messages shown in the left hand column are displayed on the CONTROL PANEL after doing the corresponding step in the right hand column.

1. CALIBRATE PRINTER
2. PRINT TEST IMAGE
3. FILM OUTPUT

[2] Press the [On Line] key to place the LASER PRINTER in the OFF LINE mode.

[3] Press the [Next] key.

[4] Press the [Next] key.

3A	RECIEVE MAGAZINE
3B	PROCESSOR

00	PRINTER READY
1.	CALIBRATE PRINTER

PRINT TEST IMAGE
------------------

PRINTING TEST IMAGE
---------------------

[5] Press the [SELECT] key.



**Important**

Either the “3A RECEIVE MAGAZINE” or “3B PROCESSOR” message will be displayed after doing the last step. The “3A RECEIVE MAGAZINE” message must be displayed to check film transport for PRINTERS attached to a processor. The “3B PROCESSOR” message must be displayed to check film transport for PRINTERS attached to a processor.

[6] If necessary, press [NEXT] to display either the “3A RECEIVE MAGAZINE” message or the “3B PROCESSOR” message.

[7] Press the [SELECT] key.

[8] Press the [On Line] key to place the LASER PRINTER in the OFF LINE mode.

[9] Press the [NEXT] key.

[10] Press the [SELECT] key.

## Setting Film Density - Beam Splitter Pulse Settings



### Important

If you do this procedure, you must do the procedure “Calibrating the Printer” on Page 4–4.

Use this procedure to set density values other than those set at the factory.

[1] Install the PORTABLE COMPUTER. See “Using the Portable Computer” in the Diagnostic Section.

[2] Load customer film into the SUPPLY MAGAZINE.

```

MAIN MENU

1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag

Enter Menu Item:
    
```

```

MONITOR MODE MENU

1 Motors           5 Sensors
2 Solenoids        6 Board Diag
3 Relay            7 Enter Commands
4 Miscellaneous    8 Set Beam-Splitter

Enter Menu Item:
    
```

```

SET BEAM-SPLITTER MENU

1 Print Grey Scale  4 Show Pulse
2 Enter Density     5 Set Each Pulse
3 Set Normal Status

Enter Manu Item:
    
```

```

Caution! Laser will be turned on.
Film size? (0-3) [3]:
    
```

```

Film size? (0-3) [3]: x
R-Magazine or Processor? (0/1) [0]:
    
```

```

Initial pulse? (0 to 200) [50]:
    
```

```

Initial pulse? (0 to 200) [50]:
Each pulse? (0 to 200) [10]:
How many times? (1 to 10) [10]:
    
```

[3] Energize the LASER PRINTER.

[4] Use the PORTABLE COMPUTER to display the CES Main Menu.

[5] Enter [1] for “Monitor Mode”.

[6] Enter [8] to set Beam-splitter.

[7] Enter [1] to print gray scale.

[8] Enter the correct number corresponding to the size of the film loaded into the SUPPLY MAGAZINE.

- 0: 8x10
- 1: 11x14
- 2: 35x35
- 3: 35x43

[9] Press [0] for RECEIVE MAGAZINE or [1] for processor.

[10] Press [ENTER] for default at the “Initial pulse?” prompt.

[11] If using 35 x 43 cm film, press [ENTER] for default at the “Each pulse?” prompt.

[12] If using other than 35 x 43 cm film, press [2] [0] at the “Each pulse?” prompt.

```

SET BEAM-SPLITTER MENU

1 Print Grey Scale      4 Show Pulse
2 Enter Density         5 Set Each Pulse
3 Set Normal Status

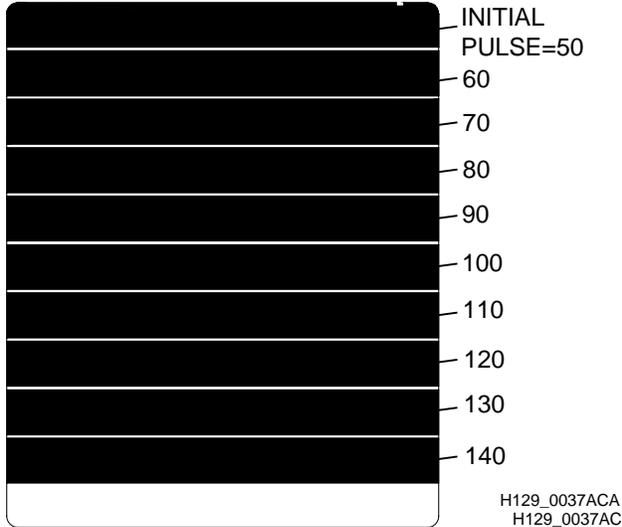
Enter Menu Item:
    
```

**[13]** If using 35 x 43 cm film, press [ENTER] for default at the “How many times?” prompt.

**[14]** If using other than 35 x 43 cm film, press [6] for 6 times at the “How many times?” prompt.

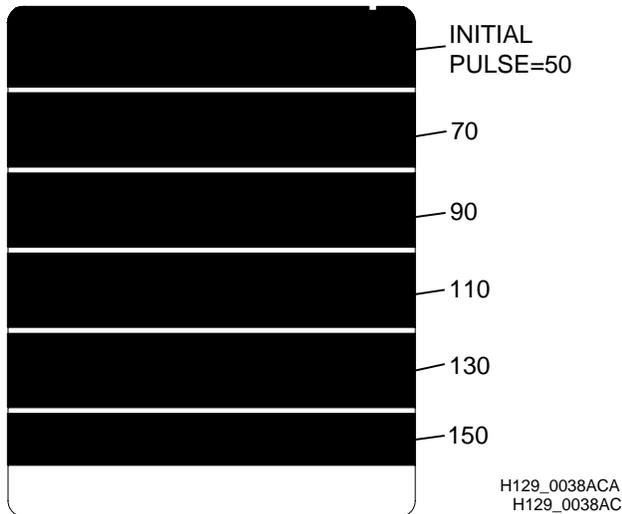
**Note**

If using 35 x 43 cm film, a 10-step grey scale will print at this time.



**Note**

If using 35 x 35 cm (8 x 10 in) film, a 6-step grey scale will print at this time.



**Note**

- The following steps show density settings for the 35 cm x 43 cm film size.
- For film sizes other than 35 cm x 43 cm, the first pulse value will be 50 and there will be 20 pulses between settings with 6 pulse settings rather than 10.

DENSITY
-3 (2.55)
-2 (2.65)
-1 (2.75)
0 (2.85)
1 (2.95)
2 (3.05)
3 (3.15)

[15] Use a DENSITOMETER to measure and record density values of each pulse value (grey scale).

- (a) The first value must be  $\leq 2.55$ .  
An error will occur if the value is  $> 2.55$ .
- (b) The last value must be  $\geq 3.15$ .  
An error will occur if the value is  $< 3.15$ .

 **Note**

If the first and last density values are not in range, repeat Steps 7 through 15. Select a different value for the initial pulse in Step 10:

- less than 50 for the condition in Step 15 (a).
- greater than 50 for the condition in Step 15 (b)

SET BEAM-SPLITTER MENU	
1 Print Grey Scale	4 Show Pulse
2 Enter Density	5 Set Each Pulse
3 Set Normal Status	
Enter Manu Item: 2	

[16] Enter [2] to enter density.

Density values shown are for example only.

50 Dens. (0.00x100 to 3.99x100) =	91
60 Dens. (0.91x100 to 3.99x100) =	139
70 Dens. (1.39x100 to 3.99x100) =	188
80 Dens. (1.88x100 to 3.99x100) =	228
90 Dens. (2.28x100 to 3.99x100) =	260
100 Dens. (2.60x100 to 3.99x100) =	285
110 Dens. (2.85x100 to 3.99x100) =	304
120 Dens. (3.04x100 to 3.99x100) =	319
130 Dens. (3.19x100 to 3.99x100) =	325
140 Dens. (3.25x100 to 3.99x100) =	334

 **Note**

Multiply the 50-pulse density value measured by 100. Example: if the density value measured is 2.50, multiplying that number by 100 would equal 250.

[17] Enter the initial density value multiplied by 100.

[18] Repeat Step 17 for the remaining 9 gray scale density readings.

 **Note**

If standard density values are desired, proceed to the next step. If other density values are desired, go to Step 22 .

SET BEAM-SPLITTER MENU	
1 Print Grey Scale	4 Show Pulse
2 Enter Density	5 Set Each Pulse
3 Set Normal Status	
Enter Menu Item: 3	

[19] Enter [3] from the Beam-splitter menu to set normal status (standard densities).

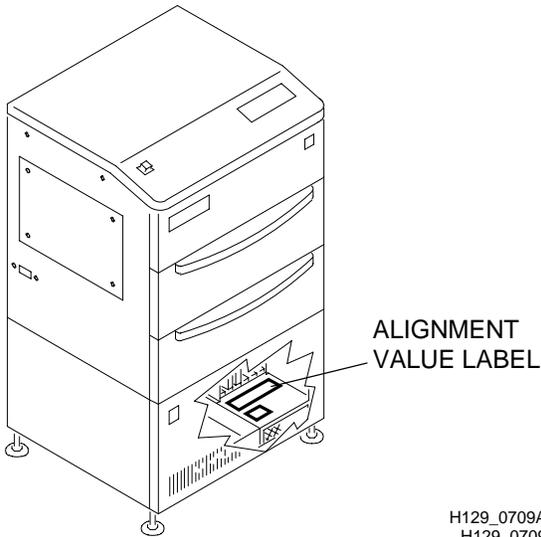
 **Note**

The pulse number for each density value will be displayed.

Pulse numbers shown are for example only.

DENSITY	PULSE NUMBER
-3 (2.55)	88
-2 (2.65)	92
-1 (2.75)	96
0 (2.85)	100
1 (2.95)	105
2 (3.05)	111
3 (3.15)	117

Save these data, Y/N (0/1) [0]:



- [20] Record the pulse number displayed on the PORTABLE COMPUTER onto the ASSIGNMENT VALUE LABEL located on top of the CARD RACK.
- [21] Enter [0] to save the pulse numbers.

```

SET BEAM-SPLITTER MENU

1 Print Grey Scale      4 Show Pulse
2 Enter Density         5 Set Each Pulse
3 Set Normal Status

Enter Menu Item: 4
    
```

- [22] If alternate density levels are needed, select [4] to show pulse.

```

Density? (0.00-3.99 (x100)): xxx

Pulse number:
    
```

- [23] Multiply the desired D-MAX value by 100 and enter that value, Example: if the density value measured is 2.50, the value entered would be 250.
- [24] Record the pulse value displayed.

[25] Repeat Steps 23 and 24 for 3 density increments above D-MAX, and 3 density increments below D-MAX. Example:

- (a) If the desired D-MAX value is 3.2, enter 320 in Step 23 and record the pulse value displayed.
  1. If 0 (D-MAX) = 3.2, then enter 320
  2. Record pulse value
- (b) For each of the 3 increments above the desired D-MAX, enter the D-MAX value + 0.10, multiplied by 100. Record the pulse value displayed.
  1. If +1 = 3.3, then enter 330  
If +2 = 3.4, then enter 340  
If +3 = 3.5, then enter 350
  2. Record pulse values displayed for each increment.
- (c) For each of the 3 increments below the desired D-MAX, enter the D-MAX value - 0.10, multiplied by 100. Record the pulse value displayed.
  1. If -1 = 3.1, then enter 310  
If -2 = 3.0, then enter 300  
If -3 = 2.9, then enter 290
  2. Record pulse values displayed for each increment.

```
          SET BEAM-SPLITTER MENU

1 Print Grey Scale      4 Show Pulse
2 Enter Density         5 Set Each Pulse
3 Set Normal Status

Enter Menu Item: 5
```

```
Density   Current   New
-3        xxx      :
-2        xxx      :
-1        xxx      :
 0        xxx      :
+1        xxx      :
+2        xxx      :
+3        xxx      :
```

**[26]** Press [ESC] to return to the Beam-splitter menu.

**[27]** Enter [5] to set each pulse.

**[28]** Enter each of the new pulse values recorded in Steps 24 and 25.

**[29]** Press [ESC] 4 times to exit diagnostics.

## Printing a Flat Field Image

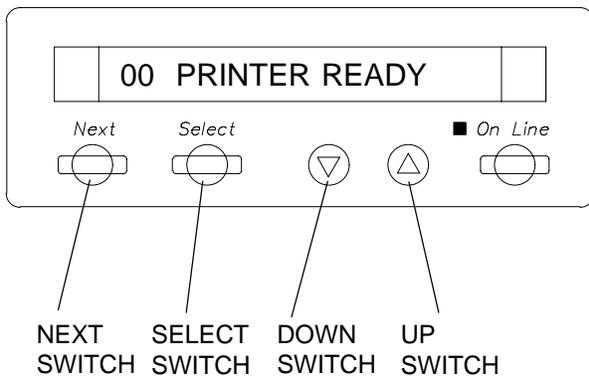
Use this procedure to check the image quality and to identify light leaks or film scratches.

Flat film (0.4D)

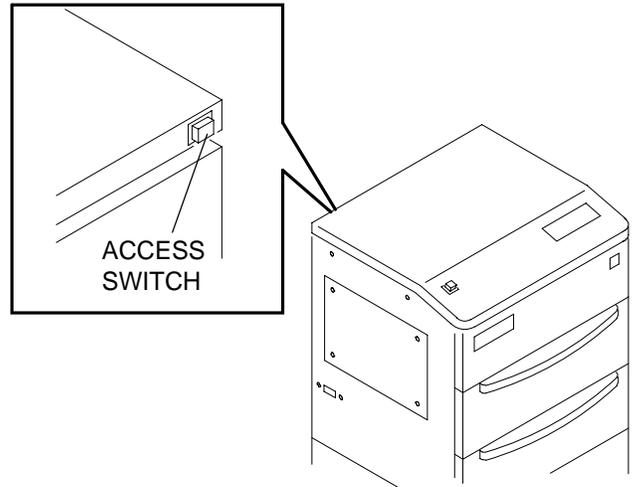
Print count: x

0.4D Flat printing

- [1] Press [NEXT], [SELECT], [▼] and the ACCESS SWITCH at the same time.
- [2] Press the [▼] and [▲] keys to change the print count.
- [3] Press [SELECT] to select a print count and start the print cycle.



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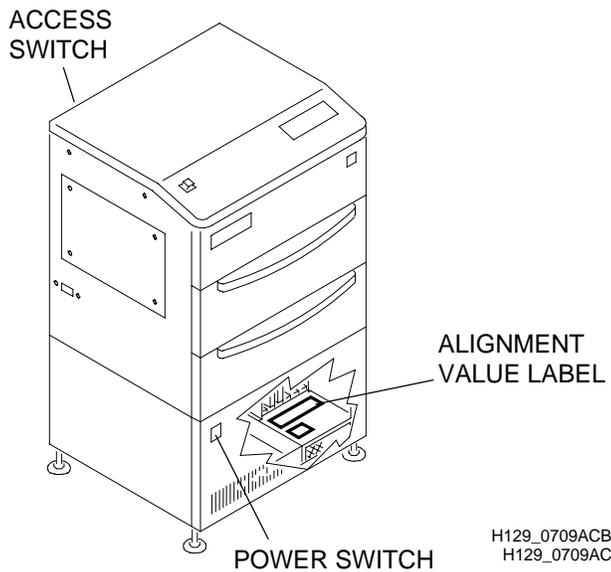


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H129\_0031AC

## CES Hidden Mode Setup Procedure

Use this procedure to enter parameters close to those obtained during calibration whenever:

- installing a new BATTERY
- installing a new SEQUENCE BOARD
- installing a new software version

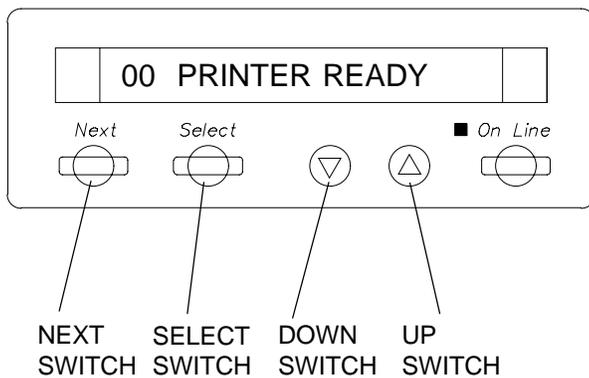


- [1] Press the [▼] key, the [▲] key, and the POWER SWITCH to 1 at the same time.
- [2] Release the switches, and then press the ACCESS SWITCH within 5 seconds.

### Note

The CONTROL PANEL will display messages as they are shown in the table on the opposite page.

- [3] Check the ALIGNMENT VALUE LABEL located in front of the CARD RACK to determine a value for the parameter being entered or changed.
- [4] Use the [NEXT] key to step through the options displayed on the CONTROL PANEL while entering the parameters required.
- [5] When entering values, do the following:
  - Press the [▼] and [▲] keys to select a value.
  - Press [NEXT] to advance to the next parameter when the correct value is displayed.
  - Press [SELECT] to enter changed values and return to normal operating mode.



H129\_2500ACA  
H129\_2500AC

The following is a list of parameters in the sequence in which they are displayed:

Parameter	Description	Enter this value:
“BS PULSE xx:yyy:	To set the beam splitter pulses from 0 to 200.	See LABEL for values.
“FILM SIZE: xxxxx”	To set the film size.	35x43/35x35/14x11/8x10
“FILM OUTPUT: xxxxx”	To set the film output.	Proc/R-Mag
“MAX RECEIVE: xxx”	To set the maximum number of film sheets for the Receive Magazine.	80/100 *
“R-MAG FILM: xxx”	To read the number of film sheets in the Receive Magazine.	0
“FST: xx.xxmm”	To set the film start position.	See LABEL for values.
“IMST (8x10): xx.xxmm”	To set the 8x10 image start position.	
“IMST: xx.xxmm”	To set an image start position other than 8x10.	
“PEST: xxx.xxmm”	To set the Polygon edge start position.	
“PEEND: xxx.xxmm”	To set the Polygon edge end position.	
“SLOW: xx.xxmm”	To set the Slow Scan direction position.	
“PRINT COUNT: xxx”	To set the number of test prints.	
“JAM ERROR: xx”	To store the jam error.	0
“ACTIVE CAL: X”		1-11
“DENSITY: xx”	To set the density. (-3 to +3)	0
“RAW DATA x:y_yy”	To enter data for calibration	(1)0.15, (2)0.22, (3)0.42, (4)0.79, (5)1.25, (6)1.73, (7)2.12, (8)2.46, (9)2.71 **
“CAL DATA: xxxx”	To use the previously entered raw data to calibrate the PRINTER when calibration error occurs. See the procedure on Page 4–12 for more information.	OK
“CONTRAST: xx”	To set the contrast for test prints.	0
“LOW STEP: xxx”	To set the number of pulses for the “Film Supply Low” message. (162 - 222)	Enter desired value, See label, default=192
“USER CAL: xxxxxxxx”	To set the permission/inhibition for calibration.	PERMIT
“TRANSPORT: NORMAL/SPECIAL”	To correct vertical banding.	NORMAL ***
“PROC TYPE:”	To choose the PROCESSOR that is docked to the PRINTER.	Choose “M35/270RA” or “M7B”. ****

\* If using 8 x 10 in. FILM, select “80” for the maximum receive value. If using 35 x 43 cm. select either “80” or “100”, depending on the particular needs of the customer.

\*\* Do not enter new values for Raw Data after Calibration has been completed.

\*\*\* Changing “TRANSPORT” from “NORMAL” to “SPECIAL” will correct vertical banding artifacts.

\*\*\*\* Used only on new PRINTERS, or old PRINTERS that have had Modification 6 installed.

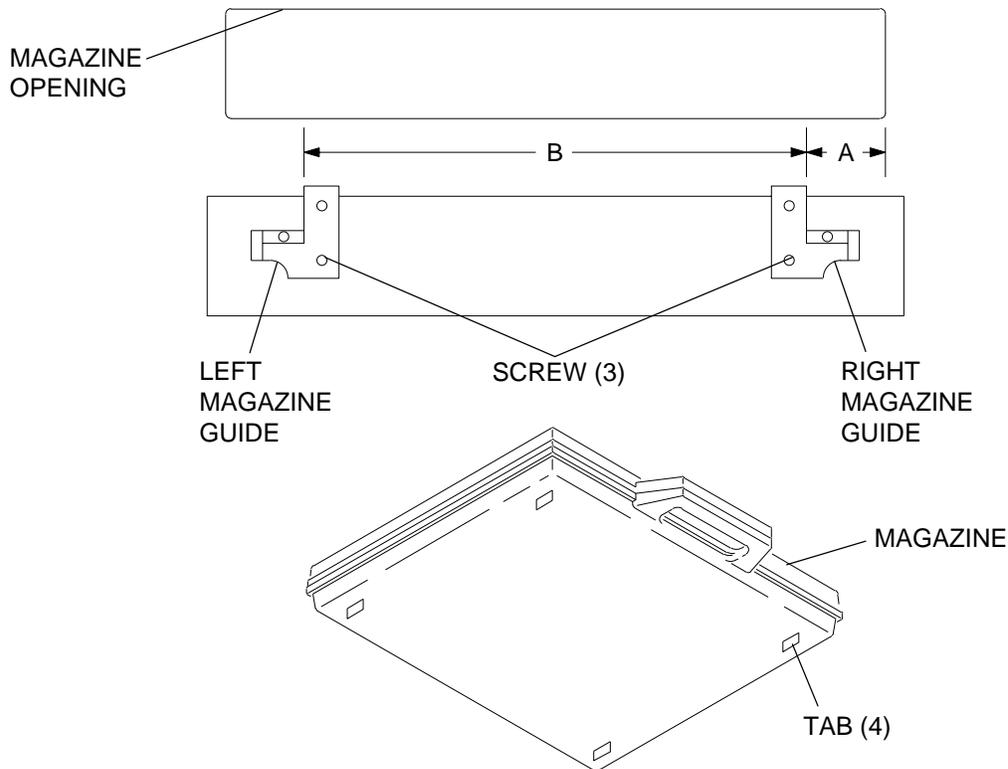
## Adjustment of the Right and Left Film Guides

If there is damage to the TABS that are located on the bottom of the MAGAZINES, adjust the RIGHT and LEFT MAGAZINE GUIDES on the SUPPLY or RECEIVE DOOR. Use the following specifications:

Dimension	Receive Door	Supply Door
A	56.8 to 57.2 mm (2.24 to 2.25 in.)	57.8 to 58.2 mm (2.28 to 2.29 in.)
B	367.0 to 368.0 mm (14.45 to 14.49 in.)	417.0 to 418.0 mm (16.42 to 16.46 in.)

**Note**

It may be easier to make a gauge from a used film that is cut to the above dimensions.



H129\_5409HCA  
H129\_5409HC

## Section 5: Electrical Adjustments

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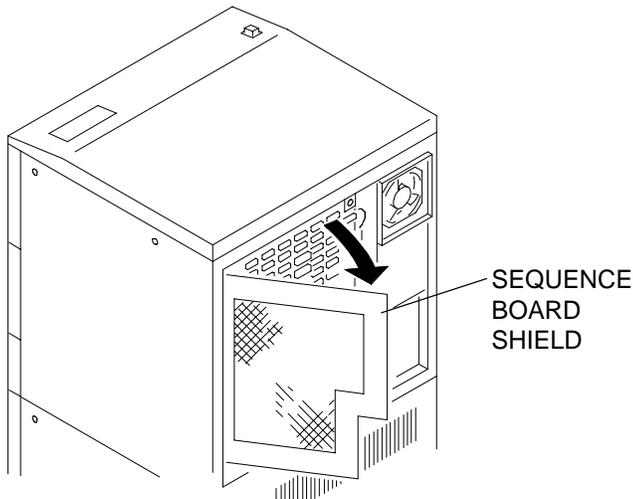
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## Circuit Boards

### Driver Board - Versions 1, 2, & 3 and Serial No. Range 500025-500389

#### DC/DC Converter Output Voltage

Use this procedure to correct timing malfunctions and to restore dropped pixels on film. If the output voltage is less than -2 Vdc, the PORTABLE COMPUTER displays the “no beam detected error”.



H129\_0601ACA  
H129\_0601AC



#### Caution

Close the MAGAZINE WINDOWS or remove the MAGAZINES before doing this adjustment.

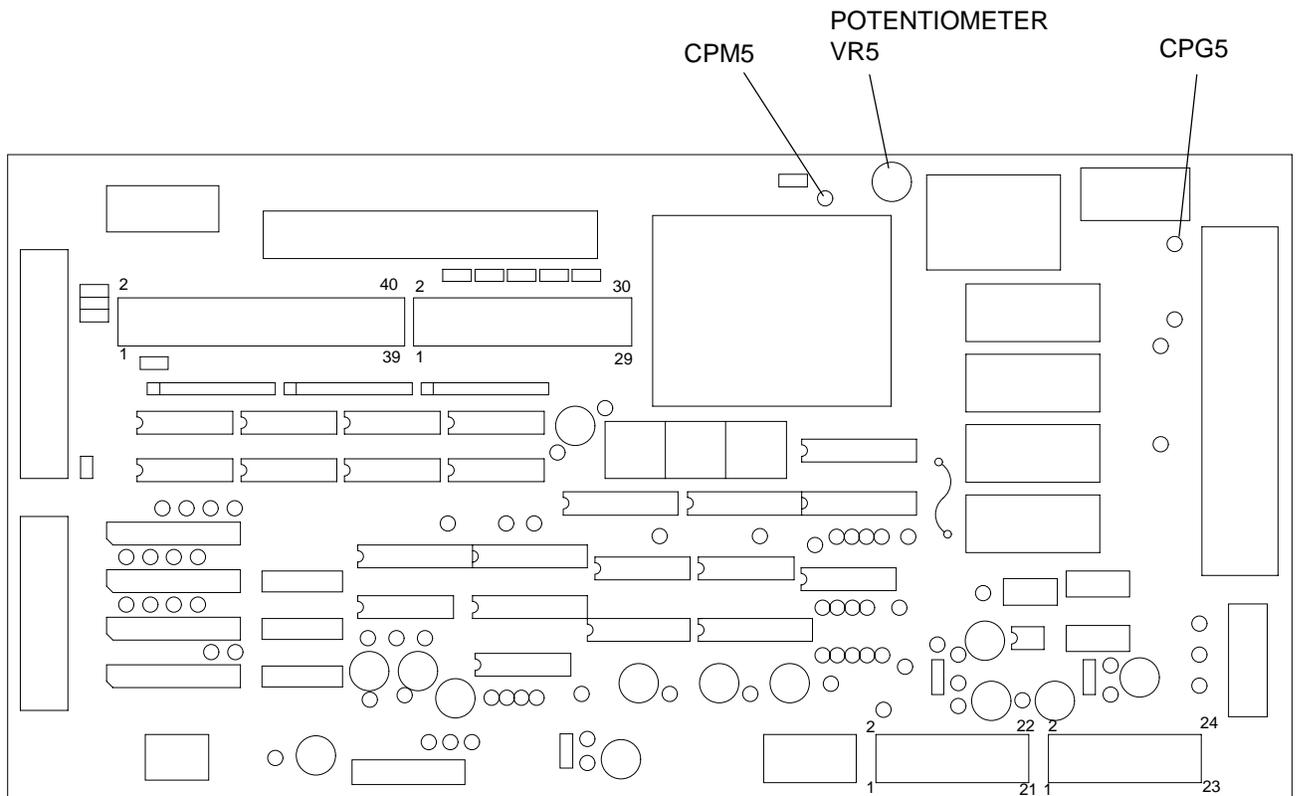
#### To Check:

- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2-3.
- [3] Open the SEQUENCE BOARD SHIELD.
- [4] Connect the DIGITAL MULTIMETER TL-3386:
  - (a) + side to CPM5 on the DRIVER BOARD
  - (b) COM side to CPG5 on the DRIVER BOARD.
- [5] Energize the LASER PRINTER.
- [6] Check that the voltage is  $-5.2 \pm 0.05$  Vdc.

#### To Adjust:

- [7] Rotate VR5 until the voltage is correct.
- [8] Close the SEQUENCE BOARD SHIELD COVER.
- [9] Replace the BACK IMAGE UNIT COVER.

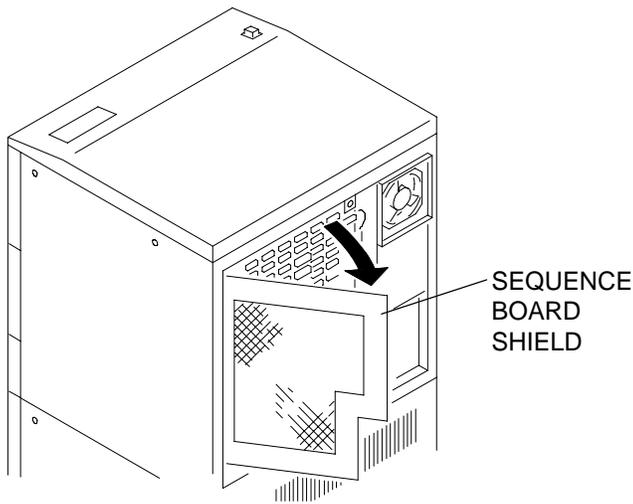
DRIVER BOARD



H129\_1706DCF  
H129\_1706DC

## Clock Frequency for Electromagnetic Pump

Use this procedure to check the vacuum pressure and the clock frequency for the ELECTROMAGNETIC PUMP when the film suction is malfunctioning.



H129\_0601ACA  
H129\_0601AC



### Caution

Close the MAGAZINE WINDOWS or remove the MAGAZINES before doing this adjustment.

### To Check:

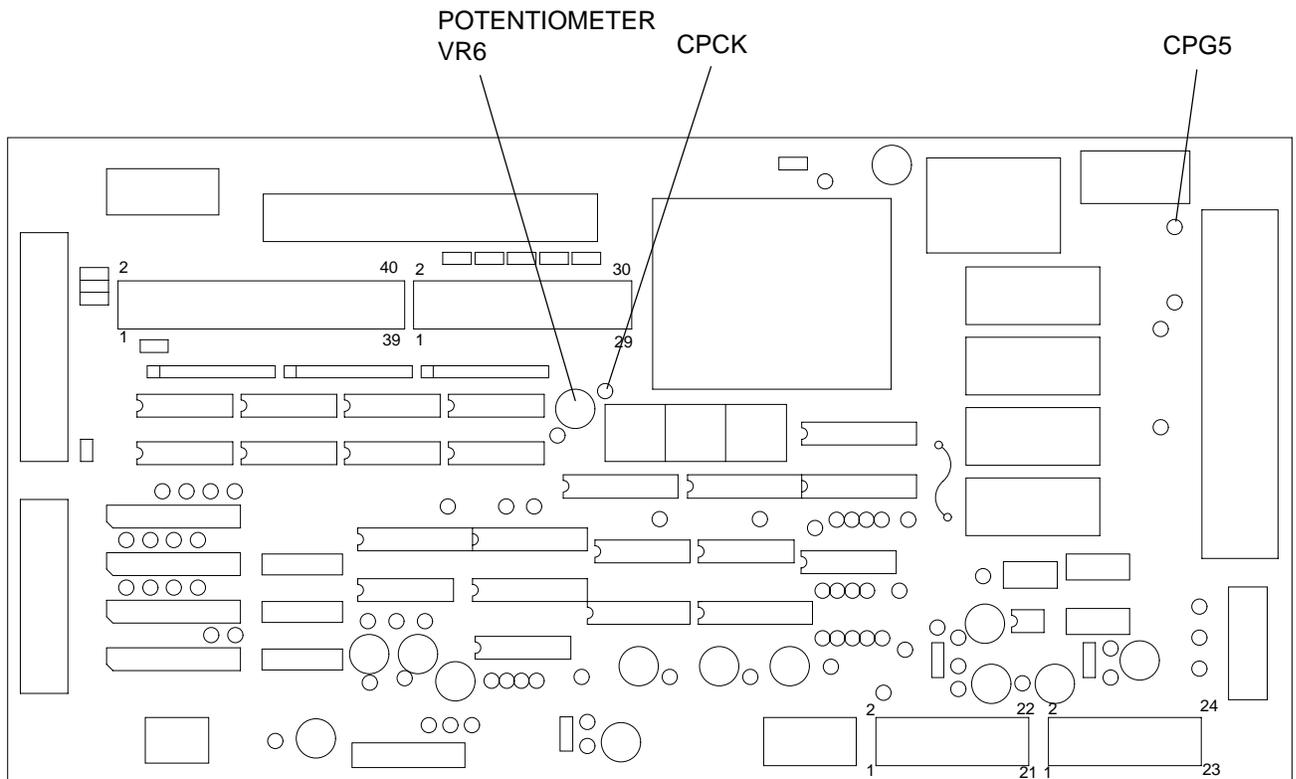
- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2-3.
- [3] Open the SEQUENCE BOARD SHIELD.

- [4] Connect a 10X Probe TL-2074 to the Channel A input of the Oscilloscope TL-3348.
- [5] Set the Volts/Div. to 2.0 V.
- [6] Set the Sec/Div. to 5 msec.
- [7] Connect the GROUND CLIP of the OSCILLOSCOPE PROBE in Channel A to CPG5 on the DRIVER BOARD.
- [8] Connect the 10X OSCILLOSCOPE PROBE in Channel A to CPCK on the DRIVER BOARD.
- [9] Energize the LASER PRINTER.
- [10] Observe the waveform on the OSCILLOSCOPE. The clock frequency should be  $55 \pm 3$  Hz. One cycle should be between 17 ms and 19 ms.

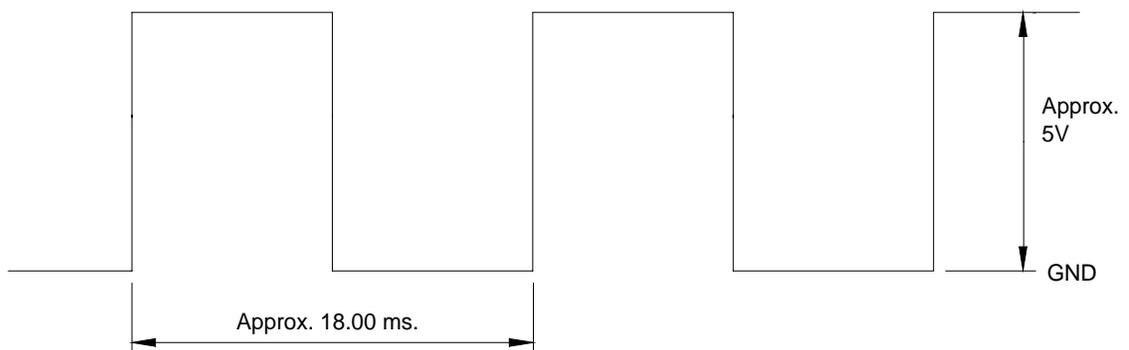
### To Adjust:

- [11] Rotate POTENTIOMETER VR6 until the wave cycle is within specification.

DRIVER BOARD



H129\_1706DCG  
H129\_1706DC



## Film Sensor Adjustments



### Important

After energizing the PRINTER, wait at least 10 minutes before adjusting the SENSORS.

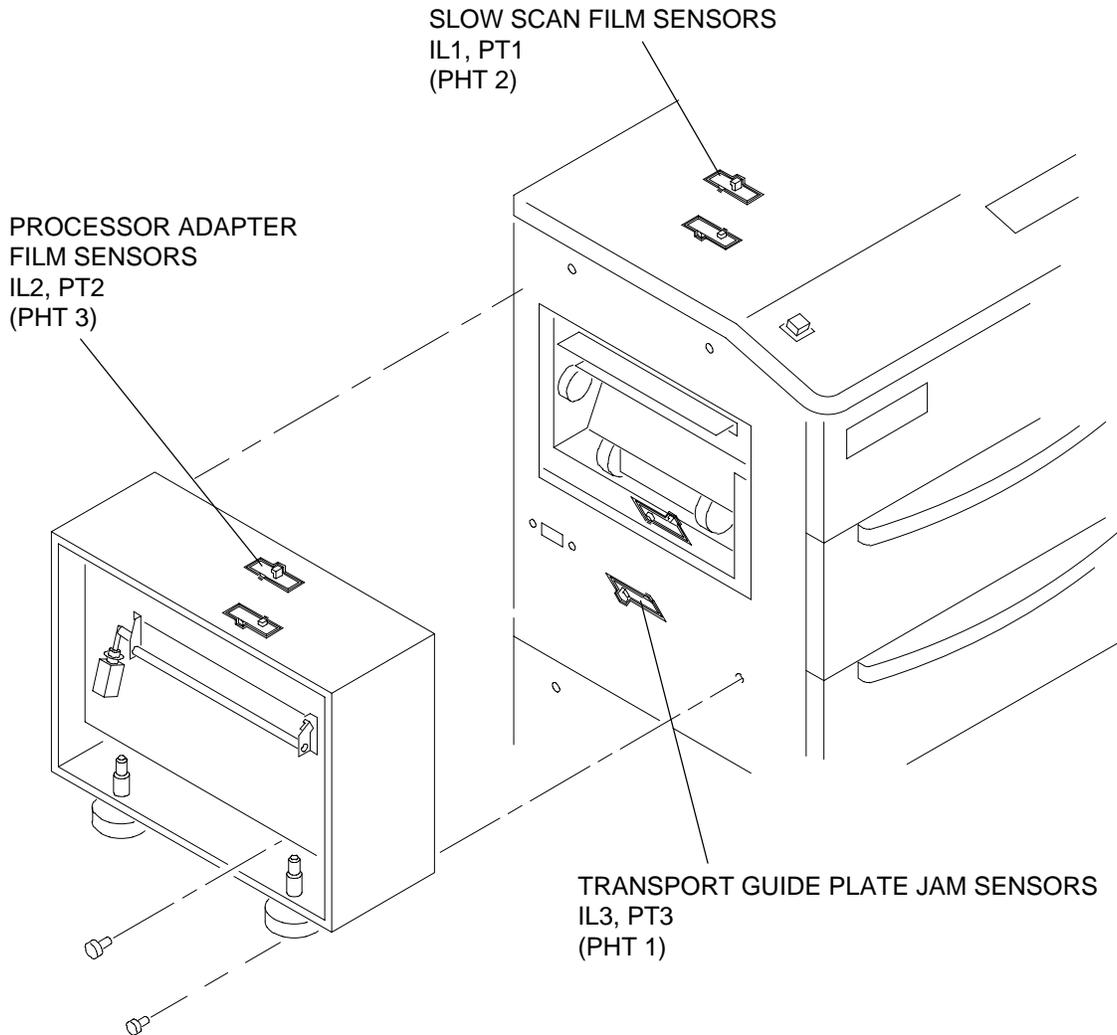
Film jam errors will occur if the voltages for the FILM SENSORS are not within the correct specification. Use this set of procedures to eliminate film jam errors caused by manufacturing changes in film, other film manufacturers, misadjusted or newly installed FILM SENSORS.



### Important

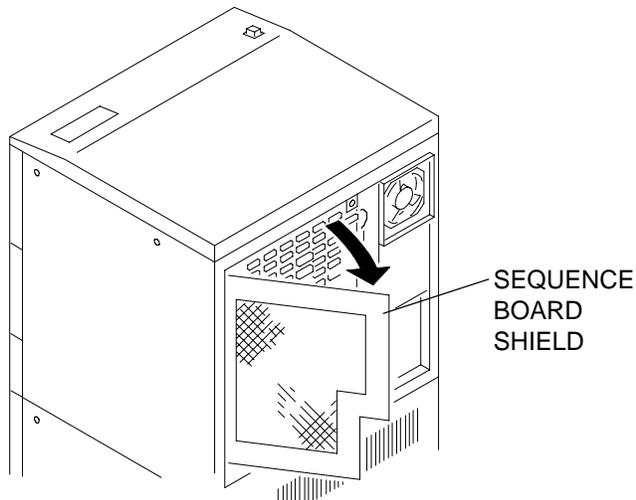
To check and adjust PHT 1,2,3, use the procedures on Pages 5-7 through 5-12. If you achieve the signals shown on Pages 5-11 and 5-12, the procedure is complete. If necessary, see the Diagnostics Manual DG3226.

Do all the FILM SENSOR Adjustments in the sequence indicated in this section.



H129\_7818DCA  
H129\_7818DC

## Emitter Intensity of Film Sensors IL1, IL2, and IL3



H129\_0601ACA  
H129\_0601AC

## To Check:

**Warning**

Dangerous Voltage.

- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [3] Open the SEQUENCE BOARD SHIELD.

Sensor	Sensor/ Emitter Symbol	To measure resistance, place meter between COM and +		To adjust resistance, rotate
Slow Scan Sensor	PHT2/IL1	CP5	P213, pin 7	VR3
Processor Adapter Sensor	PHT3/IL2	CP5	P211, pin 7	VR4
Transport Sensor	PHT1/IL3	CP5	P212, pin 9	VR13

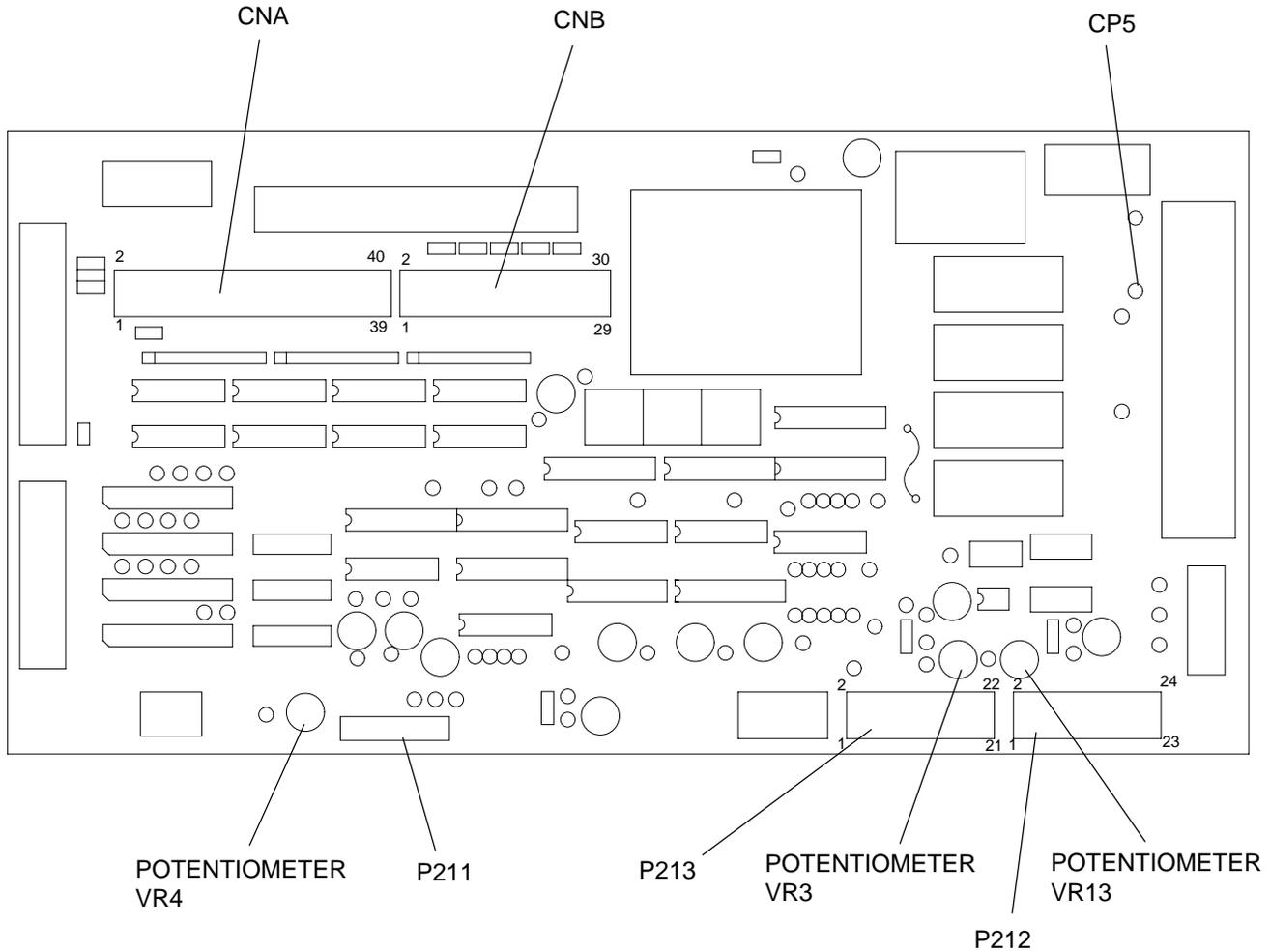
- [4] Disconnect CONNECTORS J211, J212 and J213 from the DRIVER BOARD.
- [5] Connect the DIGITAL MULTIMETER, TL-3386, to the following test points on the DRIVER BOARD:
  - IL1: Between CP5 and P213 - PIN7 for the SLOW SCAN FILM SENSOR
  - IL2: Between CP5 and P211 - PIN7 for the FILM PROCESSOR ADAPTER FILM SENSOR
  - IL3: Between CP5 and P212 - PIN9 for the TRANSPORT GUIDE PLATE JAM SENSOR
- [6] Check that the resistance is  $600\Omega \pm 10\Omega$ .



**Important**

If necessary, do the adjustment procedure in the following step.

**DRIVER BOARD**



H129\_1706DCA  
H129\_1706DC

**To Adjust:**

[7] Rotate the correct POTENTIOMETER for each sensor until the value is within specification.

IL1: VR3 for the SLOW SCAN FILM SENSOR

IL2: VR4 for the FILM PROCESSOR ADAPTER FILM SENSOR

IL3: VR13 for the TRANSPORT GUIDE PLATE JAM SENSOR

[8] Replace connectors J211, J212, and J213.

---

## Output Voltage for Receivers PT1, PT2, and PT3

Perform this procedure to ensure the output voltages of RECEIVERS PT1, PT2, and PT3 are correct for the DRIVER BOARD to convert to a TTL level used at the SEQUENCE BOARD. It will be necessary to check this output when changing film manufacturers, replacing sensors and/or DRIVER BOARD.

### To Check:

[1] Connect the Channel A and the Channel B GROUND CLIPS to CPG5.

[2] Connect the Channel A OSCILLOSCOPE PROBE to the correct TEST POINT:

#### Note

This gives the analog output of each FILM JAM SENSOR.

- PH2 for the SLOW SCAN FILM SENSOR
- PH3 for the FILM PROCESSOR ADAPTER FILM SENSOR
- PH1 for the TRANSPORT GUIDE PLATE FILM SENSOR

[3] Set the Sec/Div to 2 ms/division.

[4] Set the Volts/Div to 1.0V for both Channel A and Channel B.

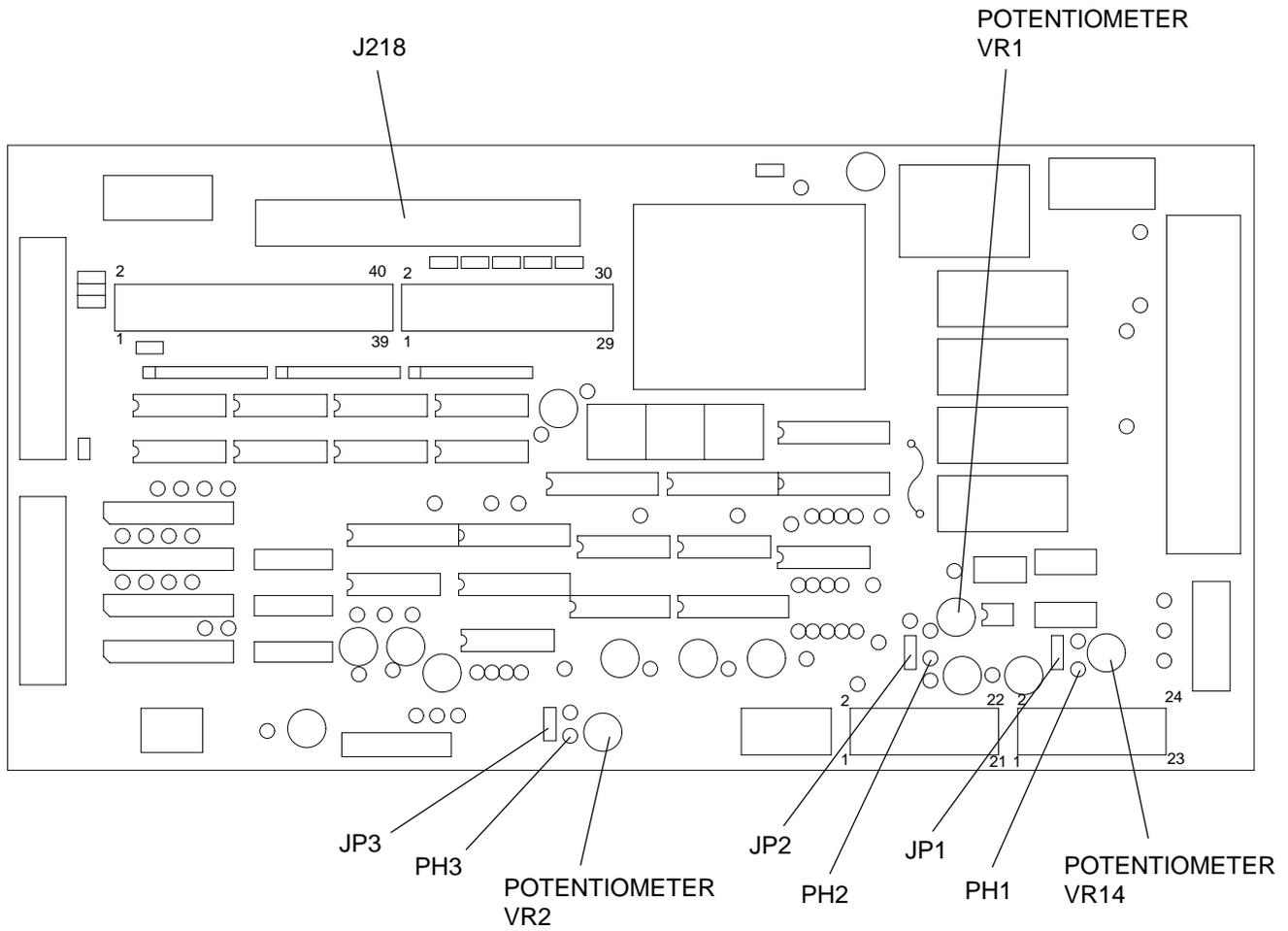
[5] Connect the Channel B OSCILLOSCOPE PROBE to the correct TEST POINT:

#### Note

This shows the TTL levels for each FILM JAM SENSOR as converted by the DRIVER BOARD.

- PHT2 for the SLOW SCAN FILM SENSOR
- PHT3 for the FILM PROCESSOR ADAPTER FILM SENSOR
- PHT1 for the TRANSPORT GUIDE PLATE FILM SENSOR

DRIVER BOARD



H129\_1706DCE  
H129\_1706DC

[6] Set the Time Base to 2 ms/division.

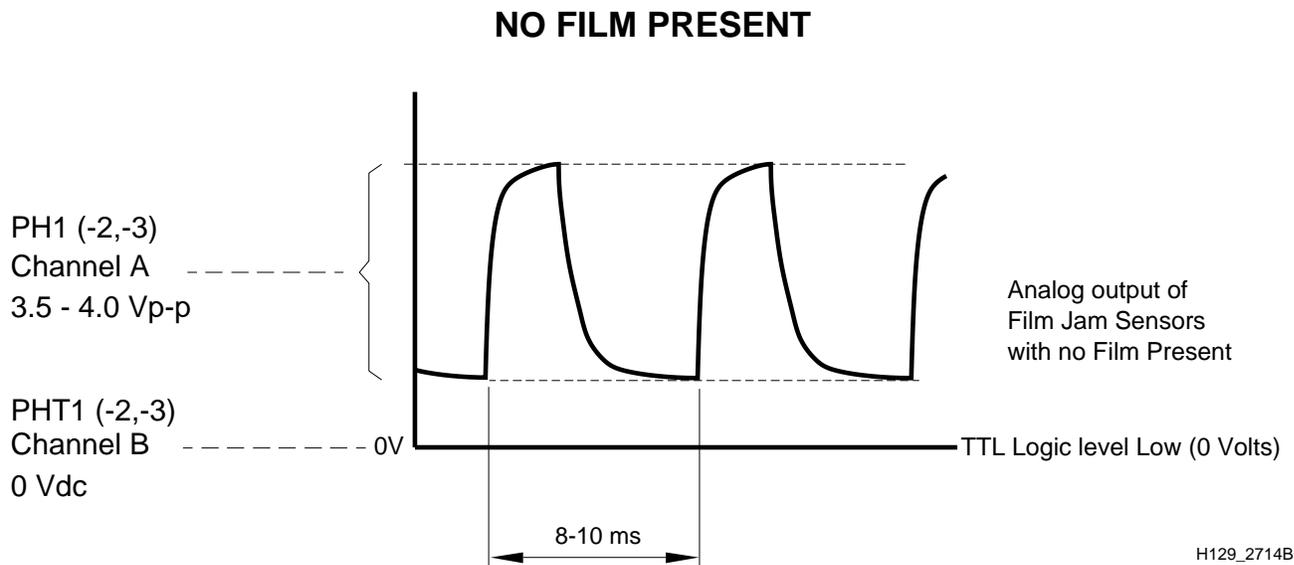
[7] Set the voltage to 1 volt/division.

**Note**

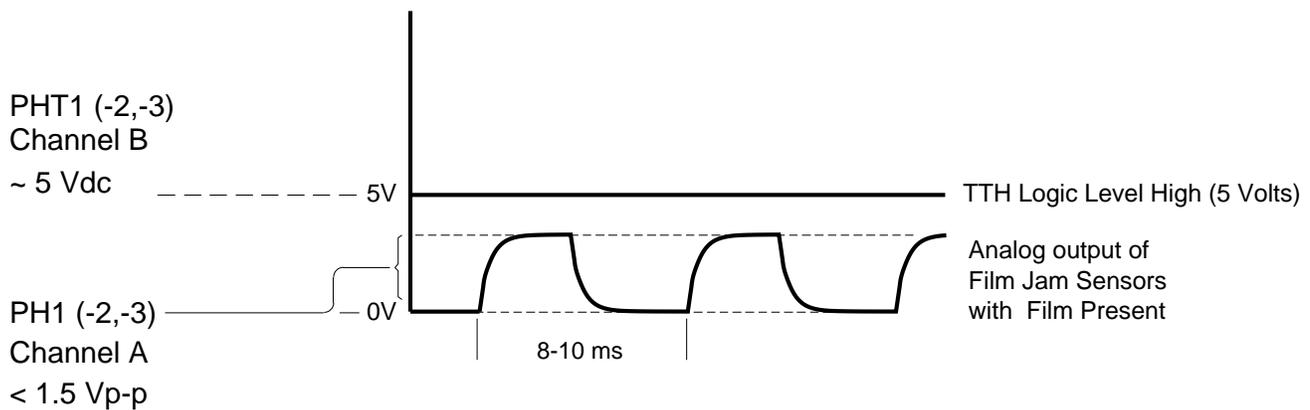
Use unprocessed film supplied by the customer.

[8] Observe the height of the waveforms on the OSCILLOSCOPE first without FILM and then with FILM inserted between the EMITTER and RECEIVER of the SENSOR. If necessary, see the Component Locator for each SENSOR location.

- Channel A
  - With no film: More than +3.5 V p-p
  - With film: Less than +1.5 V p-p
- Channel B
  - With no film: 0 Vdc
  - With film: 5 Vdc



**FILM PRESENT**



H129\_2715BC

**To Adjust:**

[9] Rotate the correct POTENTIOMETER for each sensor until the value is within specification.

PHT2: VR1 for the SLOW SCAN FILM SENSOR

PHT3: VR2 for the FILM PROCESSOR ADAPTER FILM SENSOR

PHT1: VR14 for the TRANSPORT GUIDE PLATE JAM SENSOR

[10] Check that Channel B SENSORS show a steady DC level with no pulses. If the Channel B SENSORS show a steady DC level, the film SENSORS are adjusted correctly. If pulses are present, do the Pulse Cycle Adjustment procedures beginning on Page 5–13.

[11] De-energize the LASER PRINTER.

[12] Remove the OSCILLOSCOPE PROBE.

Oscilloscope Connection to Driver Board			Adjustment
Channel B	Channel A	Ground Point	Potentiometer
PHT2	PH2	CPG5	VR1
PHT3	PH3	CPG5	VR2
PHT1	PH1	CPG5	VR14

**Temporary Emitter Pulse Cycle**

[13] Disconnect J218 from the DRIVER BOARD.

[14] Set the Volts/Div. to 2.0 V for both Channel A and Channel B.

[15] Set the Sec/Div. to 5 ms.

[16] Connect the Channel A OSCILLOSCOPE PROBE to the correct TEST POINT:

IL1: LD2 for the SLOW SCAN FILM SENSOR

IL2: LD3 for the FILM PROCESSOR ADAPTER FILM SENSOR

IL3: LD1 for the TRANSPORT GUIDE PLATE JAM SENSOR

[17] Connect the Channel B OSCILLOSCOPE PROBE to the TEST POINTS:

- PHT2 for the SLOW SCAN FILM SENSOR
- PHT3 for the FILM PROCESSOR ADAPTER FILM SENSOR
- PHT1 for the TRANSPORT GUIDE PLATE FILM SENSOR

[18] Energize the LASER PRINTER.

[19] Observe the waveform on Channel A of the OSCILLOSCOPE.

**Note**

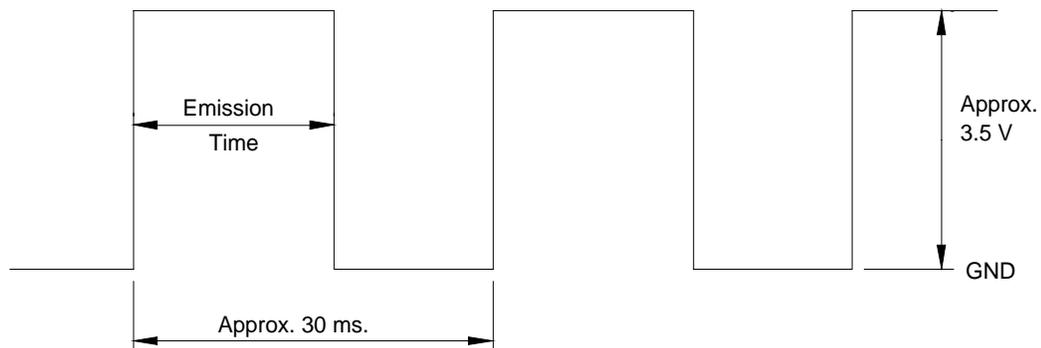
The period of the waveform must be changed to 25-30 ms so that the next adjustment can be done. The period will be readjusted to 8 - 10 ms in the Permanent Emitter Pulse Cycle adjustment on Page 5-17.

[20] Rotate the correct POTENTIOMETER for each sensor until the period is 25-30 ms.

IL1: VR7 for the SLOW SCAN FILM SENSOR

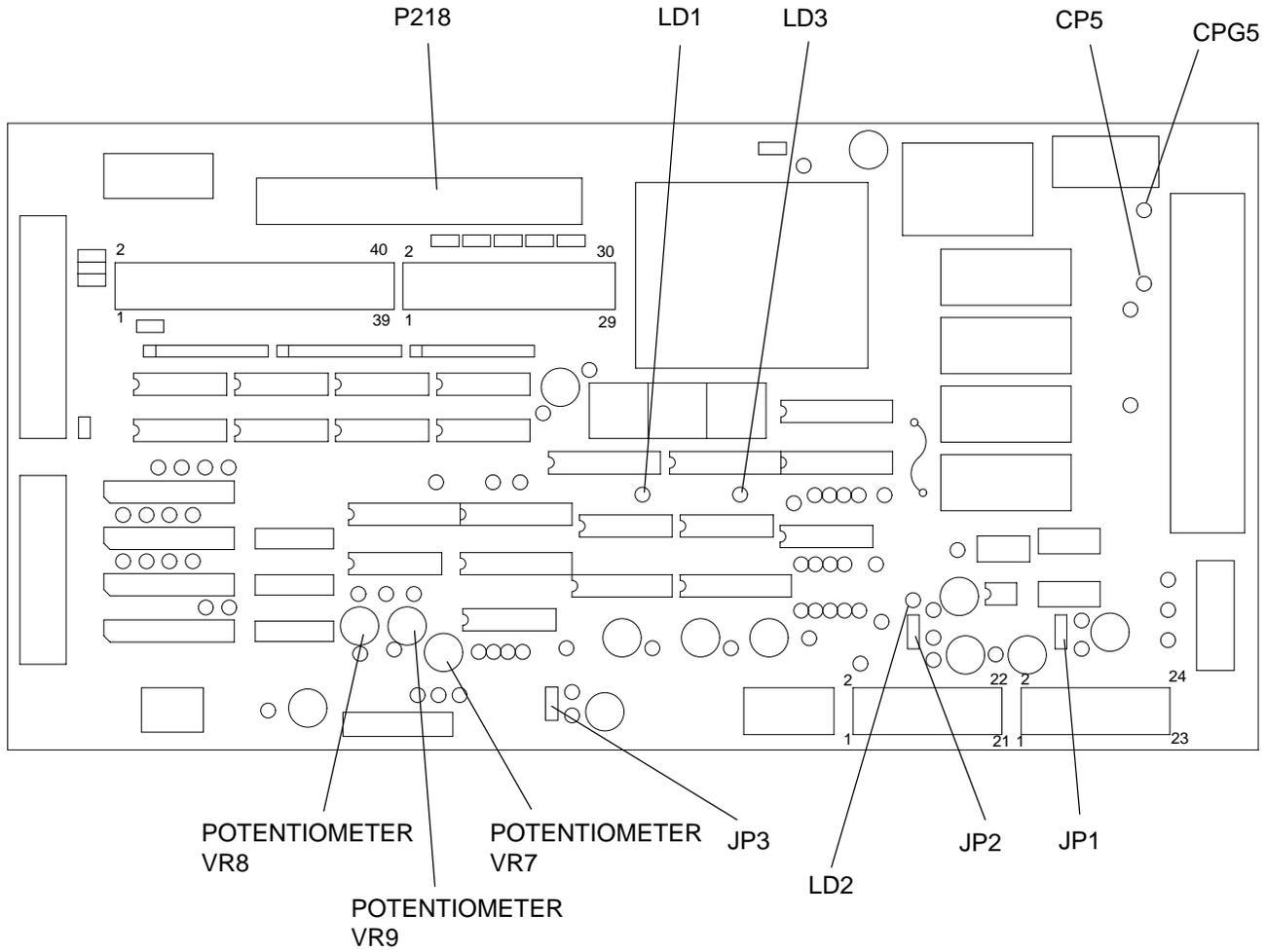
IL2: VR8 for the FILM PROCESSOR ADAPTER FILM SENSOR

IL3: VR9 for the TRANSPORT GUIDE PLATE JAM SENSOR



H129\_1910BC

DRIVER BOARD



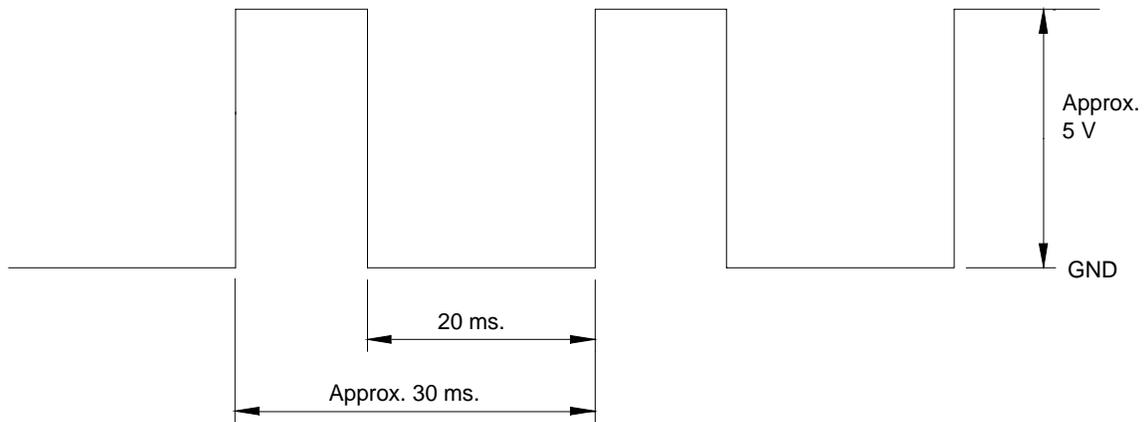
H129\_1706DCB  
H129\_1706DC

**No Film Signal Holding Time**

Sensor	Symbol	To observe waveform, place oscilloscope between GND and PROBE		To adjust waveform period, rotate
Slow Scan Sensor	IL1	CPG5	PHT2	VR10
Film Processor Adapter Sensor	IL2	CPG5	PHT3	VR11
Transport Sensor	IL3	CPG5	PHT1	VR12

**To Check:**

[21] Observe the wavelength on Channel B of the OSCILLOSCOPE. The pulse width should be between 20 ms and 22 ms.



H129\_1911BC

**To Adjust:**

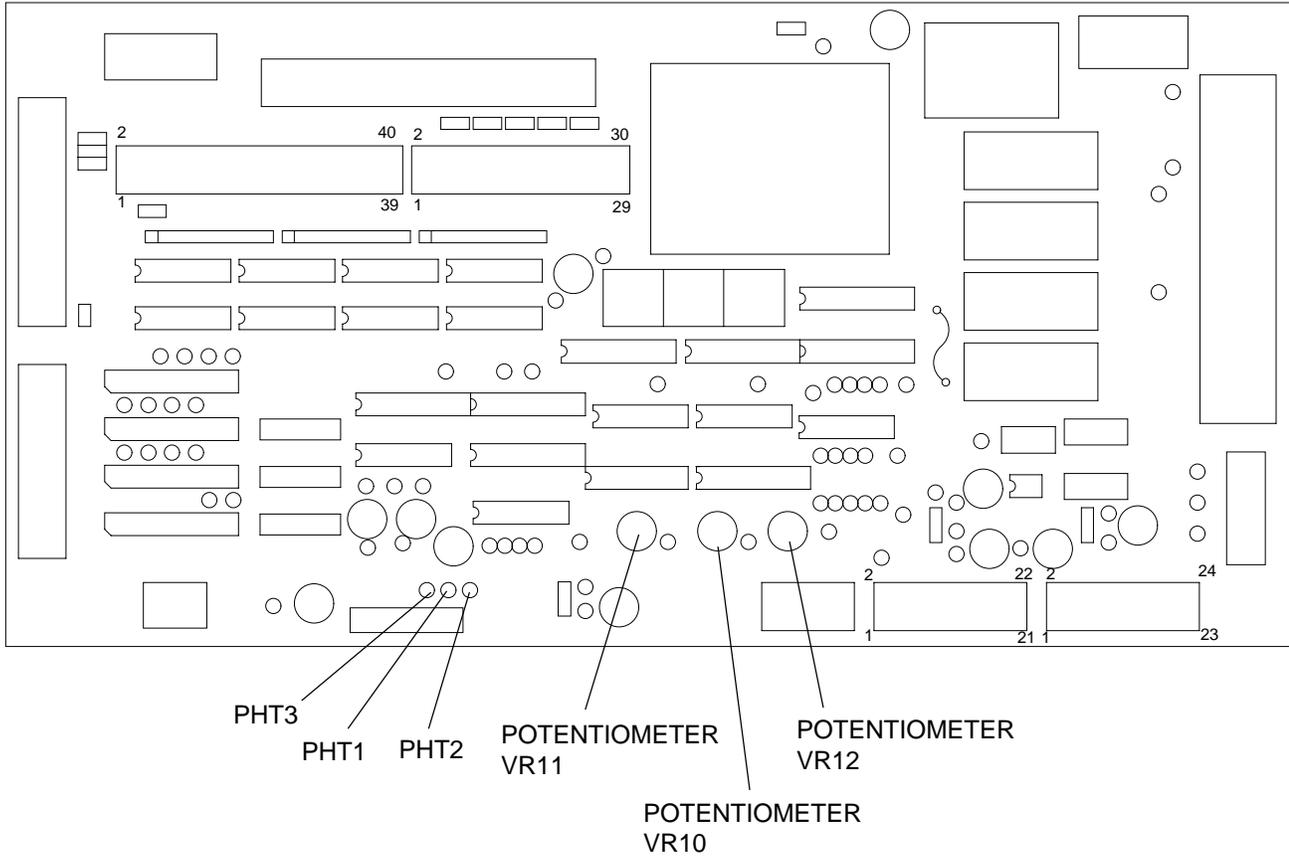
[22] Rotate the correct POTENTIOMETER for each sensor until the value is within specification.

IL1: VR10 for the SLOW SCAN FILM SENSOR

IL2: VR11 for the FILM PROCESSOR ADAPTER FILM SENSOR

IL3: VR12 for the TRANSPORT GUIDE PLATE JAM SENSOR

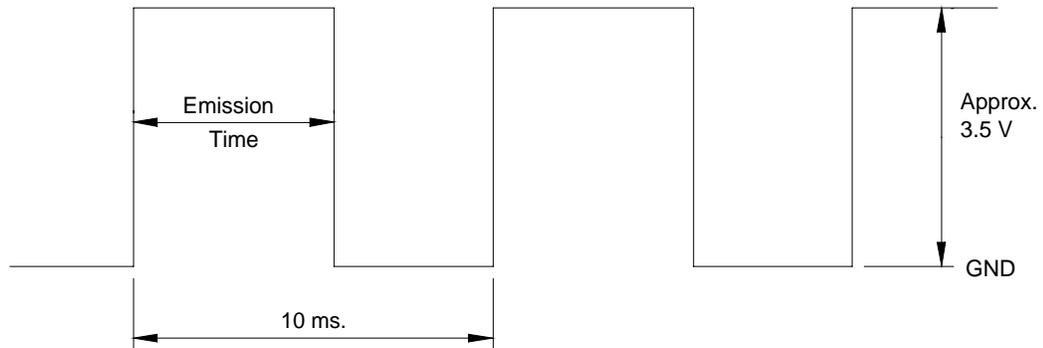
DRIVER BOARD



H129\_1706DCC  
H129\_1706DC

**Permanent Emitter Pulse Cycle**

Sensor	Symbol	To observe waveform, place oscilloscope between GND and PROBE		To adjust waveform period, rotate
Slow Scan Sensor	IL1	CPG5	LD2	VR7
Film Processor Adapter Sensor	IL2	CPG5	LD3	VR8
Transport Sensor	IL3	CPG5	LD1	VR9



H129\_1912BC

[23] Adjust the correct POTENTIOMETER for each sensor until the value is within the above specification.

IL1: VR7 for the SLOW SCAN FILM SENSOR

IL2: VR8 for the FILM PROCESSOR ADAPTER FILM SENSOR

IL3: VR9 for the TRANSPORT GUIDE PLATE FILM JAM SENSOR

**Note**

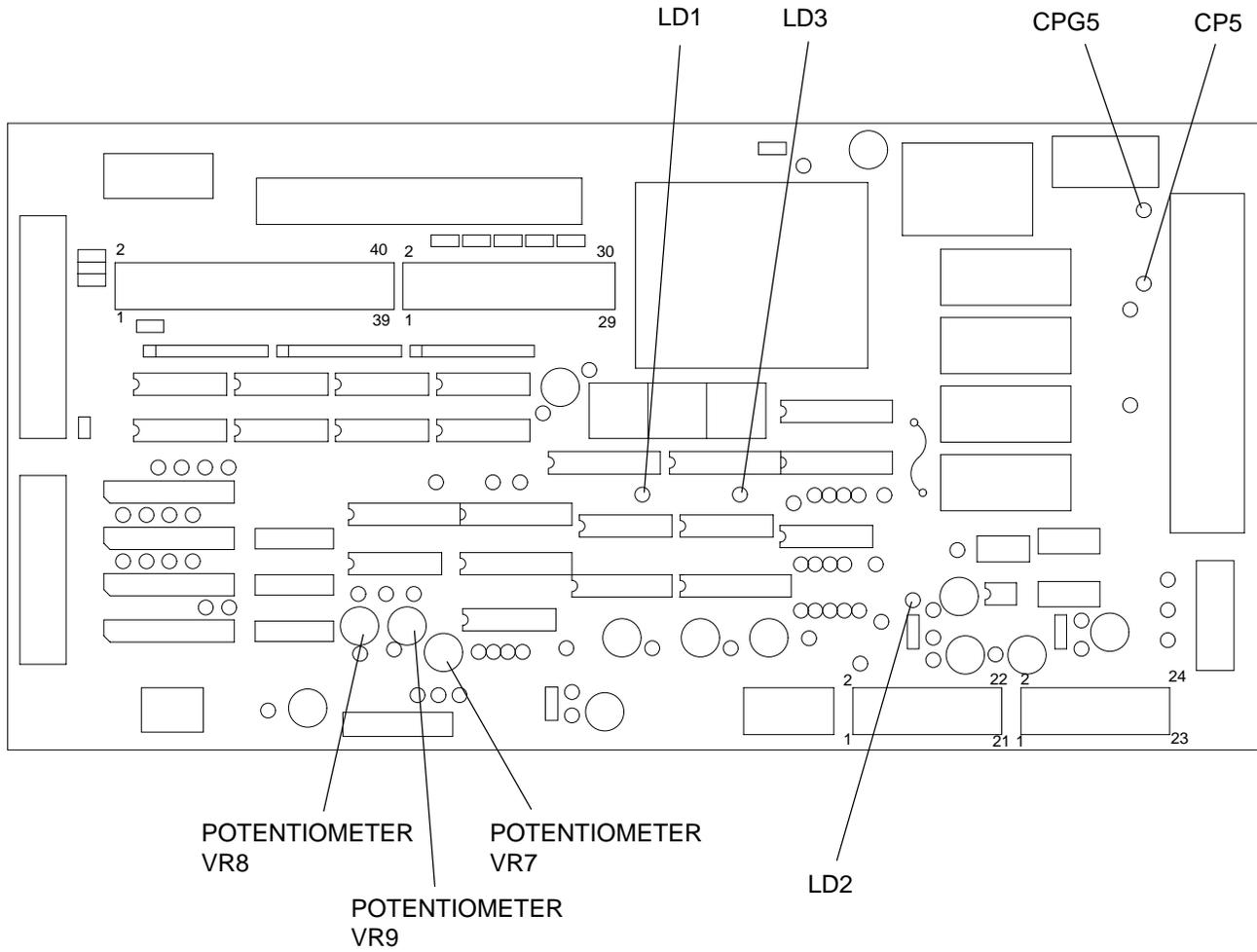
The Channel B signal should be a constant low.

[24] Insert a FILM between the emitter and receiver of each sensor to see that the signal on Channel B goes high as FILM is detected.

[25] De-energize the LASER PRINTER.

[26] Connect J218.

DRIVER BOARD



H129\_1706DCD  
H129\_1706DC

**Emitter Pulse Duty Ratio for IL1, IL2, and IL3**

Duty Cycle Ratio is defined as percent of time the SENSORS are on divided by the percent of time the SENSORS are off.

Lower the Duty Cycle Ratio if film fogging has occurred. Adjusting the 3 SWITCHES changes the ratio of emitter time per cycle. The Duty Ratio may need to be changed when non-Kodak films are used.

 **Note**

The switches RSW1 and RSW2 on the DRIVER BOARD are factory-set to 8 for a Duty Ratio of 60%. RSW3 is factory set to 3 for a Duty Ratio of 28 percent.

PHT2, IL1 - RSW2: for the SLOW SCAN FILM SENSOR

PHT3, IL2 - RSW3: for the FILM PROCESSOR ADAPTER SENSOR

PHT1, IL3 - RSW1: for the TRANSPORT GUIDE PLATE FILM JAM SENSOR

 **Note**

If changing the Duty Ratio, select one of the following switch settings to select the percent shown:

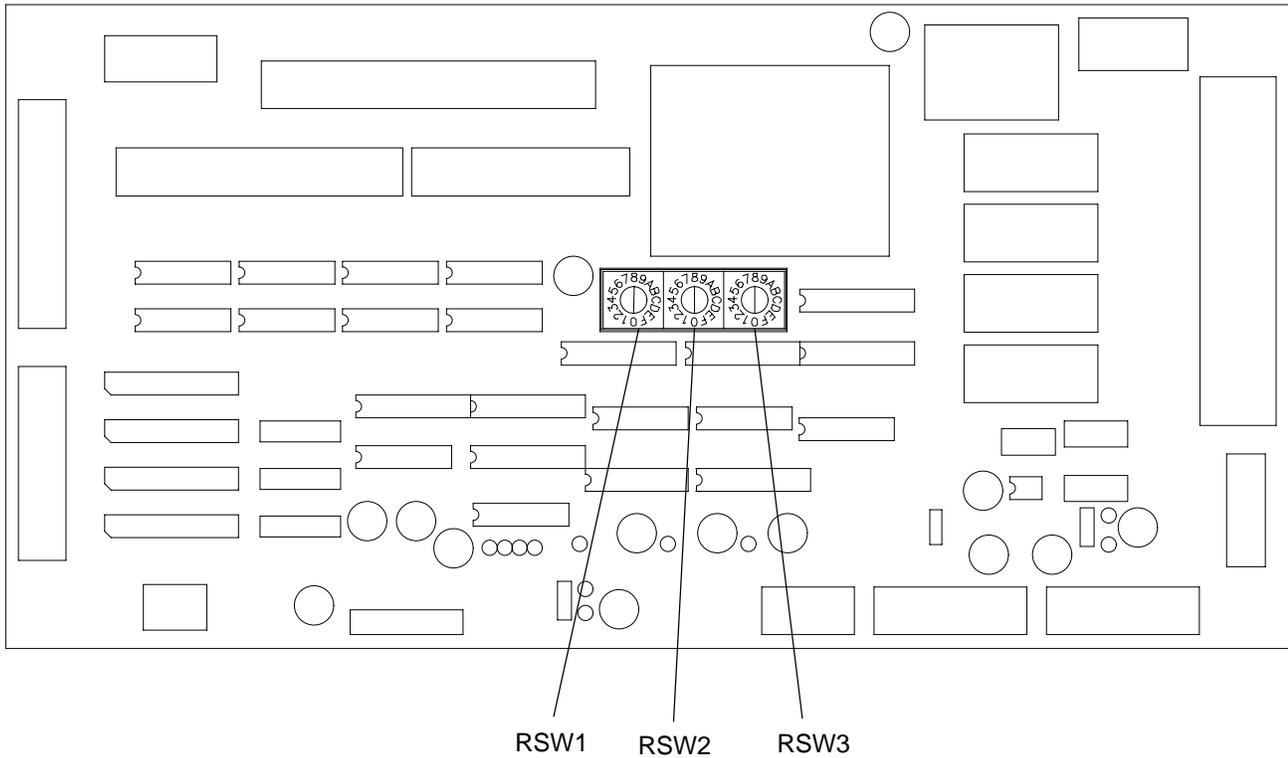
Switch Setting	Duty Ratio	Switch Setting	Duty Ratio
*0	9.4%	8	60%
*1	16%	9	66%
2	22%	*A	72%
3	28%	*B	78%
4	34%	*C	84%
5	41%	*D	91%
6	47%	*E	97%
7	53%	*F	100%

\* Not recommended.

 **Important**

If you change the Duty Ratio, the Output Voltage for Receivers will need to be checked. Adjust as necessary.

DRIVER BOARD



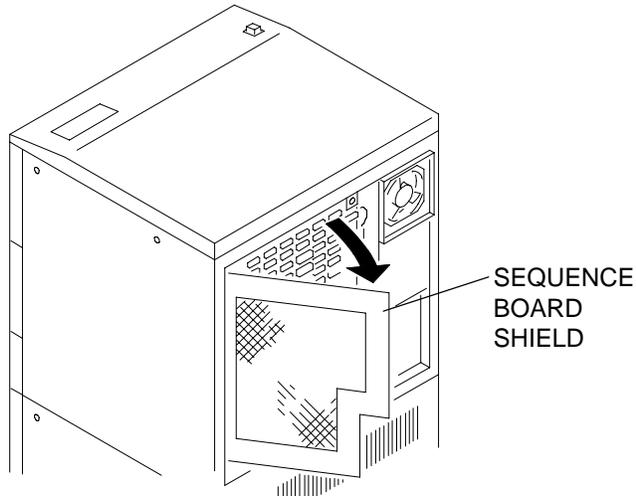
H129\_1710DCA  
H129\_1710DC

- [27] Change the switch settings for each sensor by trial and error until the film-fogging problem is cleared. Use the Flat Field procedure on Page 4-21 to check the image after setting the duty ratio.
- [28] Check the receiver output voltage for PT1, PT2, or PT3 after changing the switch setting. See the procedure on Page 5-9.

## Driver Board - Versions 4, 5, 6 & Universal and Serial No. Range 500390-500898, 600133-600306

### DC/DC Converter Output Voltage

Use this procedure to correct timing malfunctions and to restore dropped pixels on film. If the output voltage is less than -2 Vdc, the PORTABLE COMPUTER displays the “no beam detected error”.



H129\_0601ACA  
H129\_0601AC



#### Caution

Close the MAGAZINE WINDOWS or remove the MAGAZINES before doing this adjustment.

#### To Check:

- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [3] Open the SEQUENCE BOARD SHIELD.
- [4] Connect the DIGITAL MULTIMETER TL-3386:
  - (a) + side to CPM5 on the DRIVER BOARD
  - (b) COM side to CPG5 on the DRIVER BOARD.

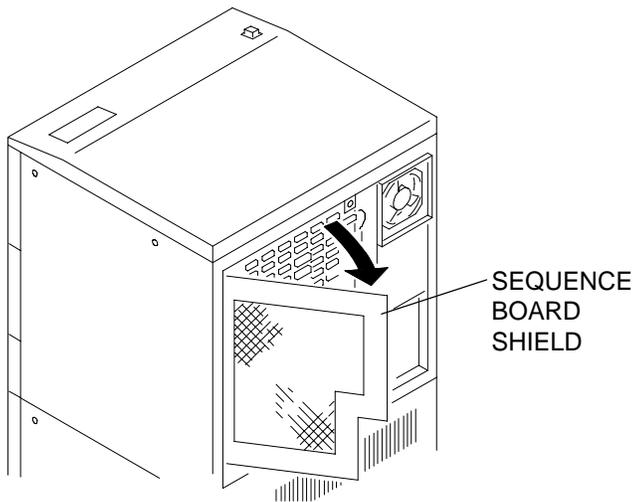
- [5] Energize the LASER PRINTER.
- [6] Check that the voltage is  $-5.2 \pm 0.05$  Vdc.

#### To Adjust:

- [7] Rotate VR5 until the voltage is correct.
- [8] Close the SEQUENCE BOARD SHIELD COVER.
- [9] Replace the BACK IMAGE UNIT COVER.

## Clock Frequency for Electromagnetic Pump

Use this procedure to check the vacuum pressure and the clock frequency for the ELECTROMAGNETIC PUMP when the film suction is malfunctioning.



H129\_0601ACA  
H129\_0601AC



### Caution

Close the MAGAZINE WINDOWS or remove the MAGAZINES before doing this adjustment.

### To Check:

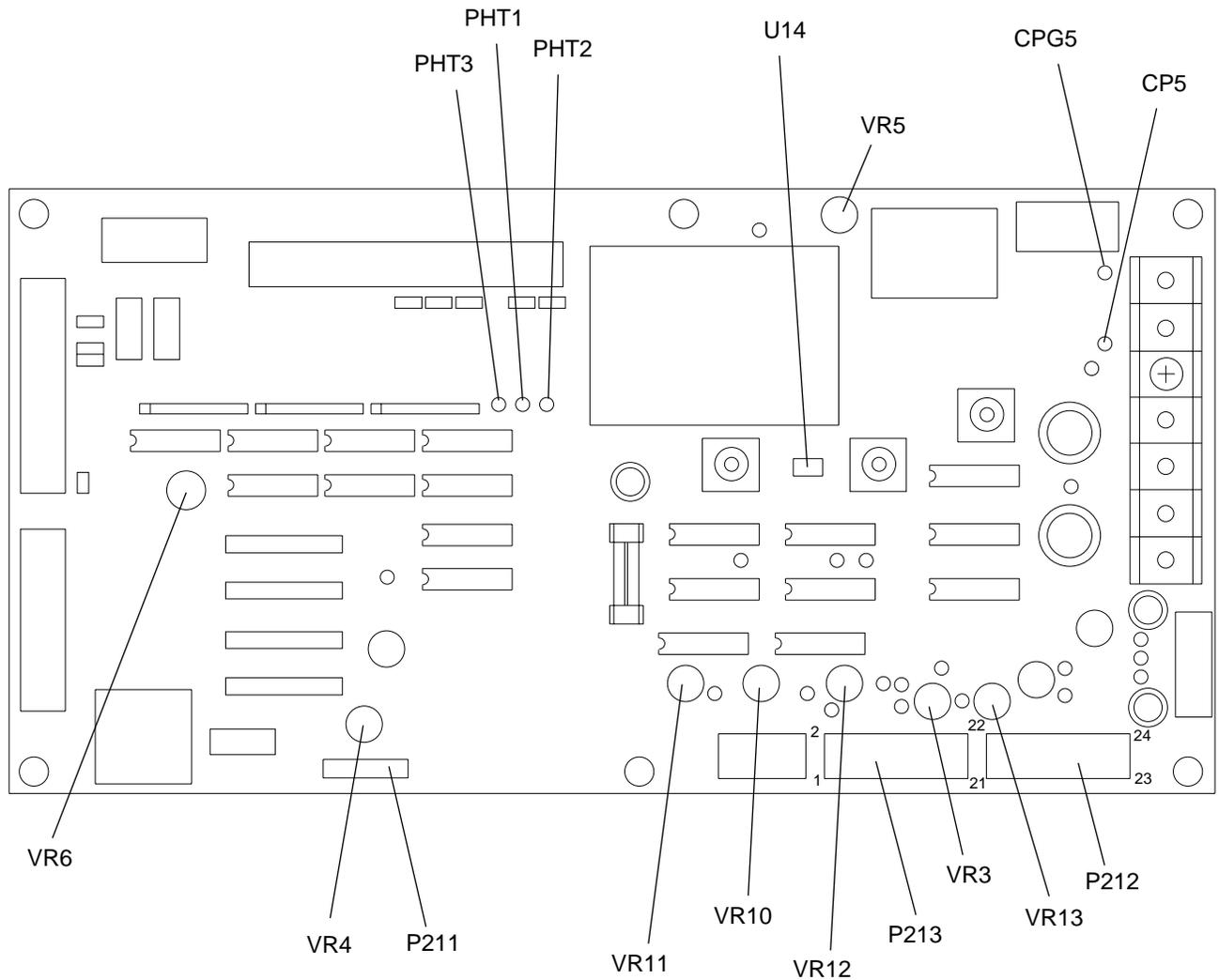
- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [3] Open the SEQUENCE BOARD SHIELD.

- [4] Connect a 10X Probe TL-2074 to the Channel A input of the Oscilloscope TL-3348.
- [5] Set the Volts/Div. to 2.0 V.
- [6] Set the Sec/Div. to 5 msec.
- [7] Connect the GROUND CLIP of the OSCILLOSCOPE PROBE in Channel A to CPG5 on the DRIVER BOARD.
- [8] Connect the 10X OSCILLOSCOPE PROBE in Channel A to CPCK on the DRIVER BOARD.
- [9] Energize the LASER PRINTER.
- [10] Observe the waveform on the OSCILLOSCOPE. The clock frequency should be  $55 \pm 3$  Hz. One cycle should be between 17 ms and 19 ms.

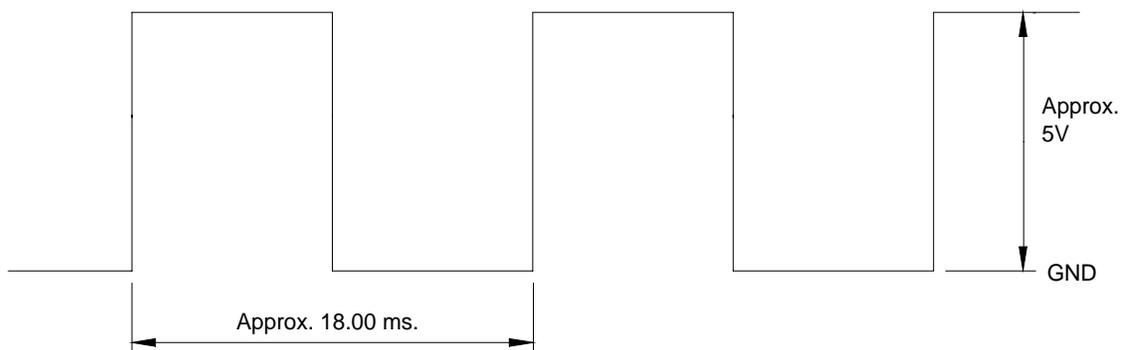
### To Adjust:

- [11] Rotate POTENTIOMETER VR6 until the wave cycle is within specification.

DRIVER BOARD



H129\_1724DCB  
H129\_1724DC



## Film Sensor Adjustments



### Important

After energizing the PRINTER, wait at least 10 minutes before adjusting the SENSORS.

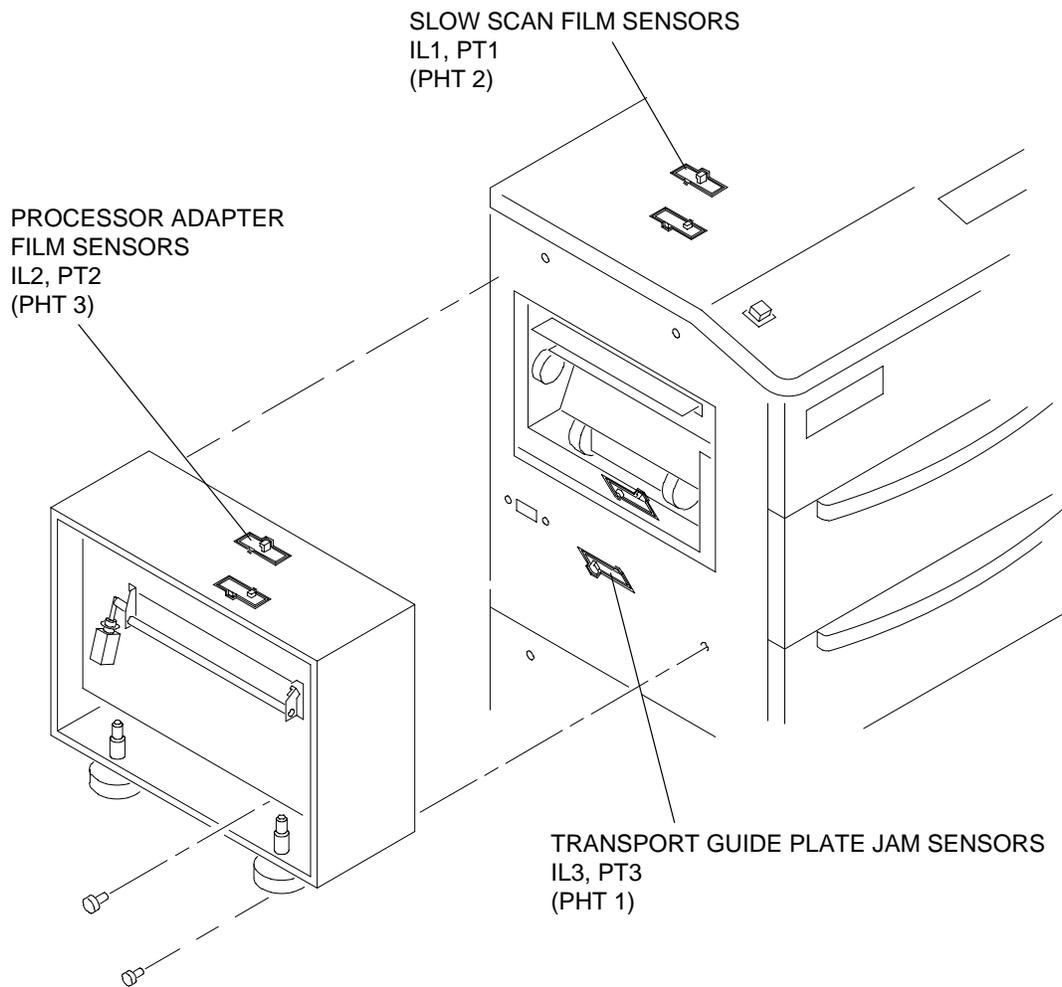
Film jam errors will occur if the voltages for the FILM SENSORS are not within the correct specification. Use this set of procedures to eliminate film jam errors caused by misadjusted, newly installed FILM SENSORS, manufacturing changes in film or other film manufacturers.



### Important

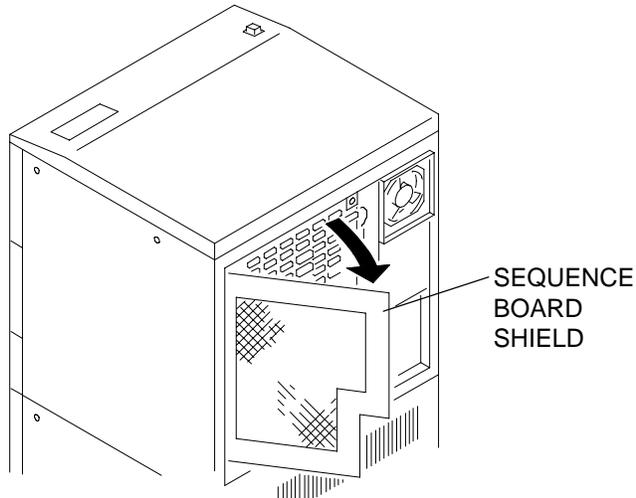
To check and adjust PHT 1,2,3, use the procedures on Pages 5-25 through 5-28. If you achieve the signals shown on Page 5-28, the procedure is complete. If necessary, see the Diagnostics Manual DG3226.

Do all the FILM SENSOR Adjustments in the sequence indicated in this section.



H129\_7818DCA  
H129\_7818DC

## Emitter Intensity of Film Sensors IL1, IL2, and IL3



H129\_0601ACA  
H129\_0601AC

### To Check:



### Warning

Dangerous Voltage.

- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [3] Open the SEQUENCE BOARD SHIELD.

Sensor	Sensor/ Emitter Symbol	To measure resistance, place meter between COM and +		To adjust resistance, rotate
Slow Scan Sensor	PHT2/IL1	CP5	P213, pin 7	VR3
Processor Adapter Sensor	PHT3/IL2	CP5	P211, pin 7	VR4
Transport Sensor	PHT1/IL3	CP5	P212, pin 9	VR13

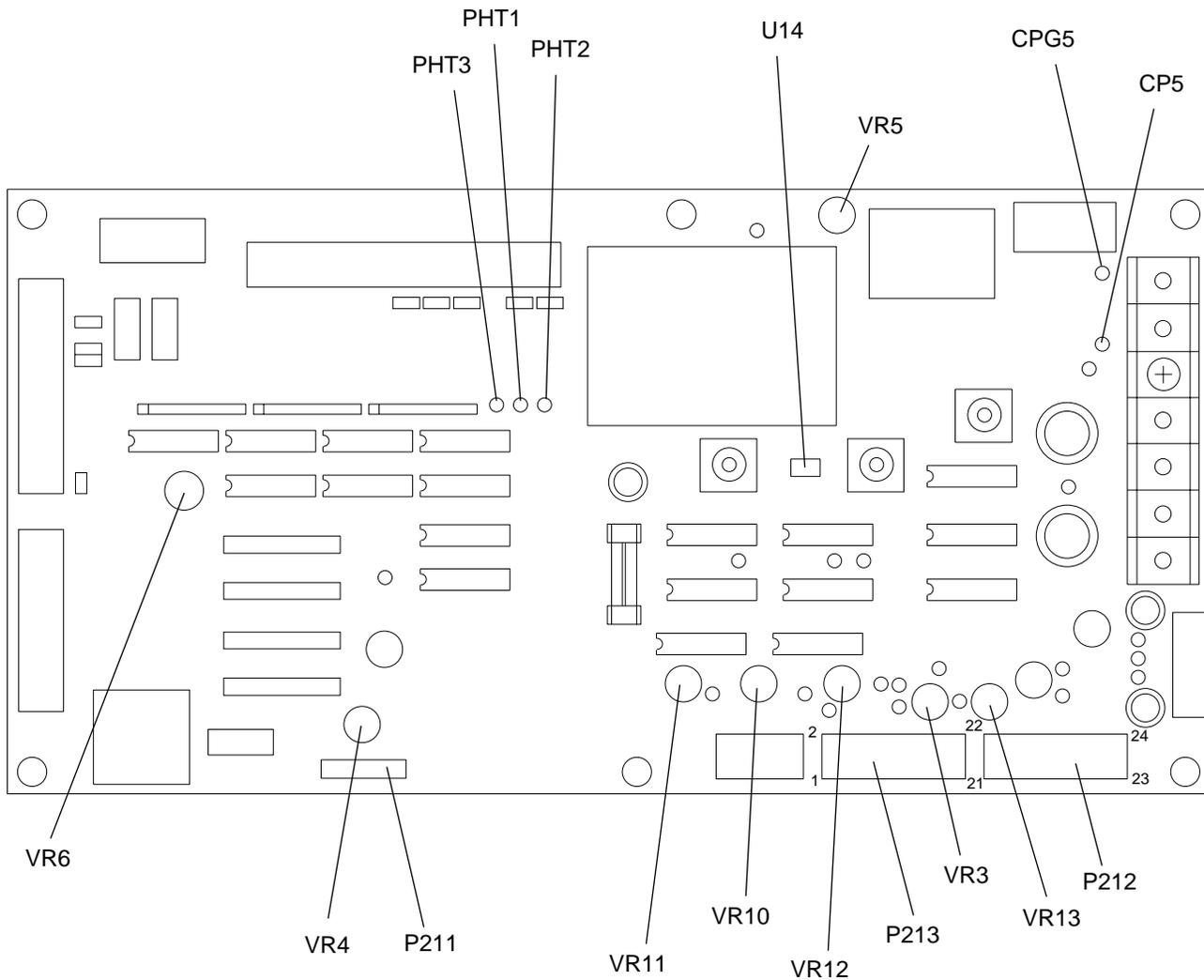
- [4] Disconnect CONNECTORS J211, J212 and J213 from the DRIVER BOARD.
- [5] Connect the DIGITAL MULTIMETER, TL-3386, to the following test points on the DRIVER BOARD:
  - IL1: Between CP5 and P213 - PIN7 for the SLOW SCAN FILM SENSOR
  - IL2: Between CP5 and P211 - PIN7 for the FILM PROCESSOR ADAPTER FILM SENSOR
  - IL3: Between CP5 and P212 - PIN9 for the TRANSPORT GUIDE PLATE JAM SENSOR
- [6] Check that the resistance is  $600\Omega \pm 10\Omega$ .



**Important**

If necessary, do the adjustment procedure in the following step.

**DRIVER BOARD**



H129\_1724DCB  
H129\_1724DC

**To Adjust:**

[7] Rotate the correct POTENTIOMETER for each sensor until the value is within specification.

IL1: VR3 for the SLOW SCAN FILM SENSOR

IL2: VR4 for the FILM PROCESSOR ADAPTER FILM SENSOR

IL3: VR13 for the TRANSPORT GUIDE PLATE JAM SENSOR

[8] Replace connectors J211, J212, and J213.

## Output Voltage for Receivers PT1, PT2, and PT3

This procedure is done to ensure the necessary output voltages are correct for the DRIVER BOARD to convert to a TTL level used at the SEQUENCE BOARD. It will be necessary to check this output when changing film manufacturers, replacing sensors and/or DRIVER BOARD.

### To Check:

- [1] Connect the Channel A and the Channel B GROUND CLIPS to CPG5.
- [2] Connect the Channel A OSCILLOSCOPE PROBE to the correct TEST POINT:

### Note

This gives the analog output of each FILM JAM SENSOR.

- PH2 for the SLOW SCAN FILM SENSOR
- PH3 for the FILM PROCESSOR ADAPTER FILM SENSOR
- PH1 for the TRANSPORT GUIDE PLATE FILM SENSOR

- [3] Set the Time Base to 2 ms/division.
- [4] Set the voltage to 1 volt/division.
- [5] Connect the Channel B OSCILLOSCOPE PROBE to the correct TEST POINT:

### Note

This shows the TTL levels for each FILM JAM SENSOR as converted by the DRIVER BOARD.

- PHT2 for the SLOW SCAN FILM SENSOR
- PHT3 for the FILM PROCESSOR ADAPTER FILM SENSOR
- PHT1 for the TRANSPORT GUIDE PLATE FILM SENSOR

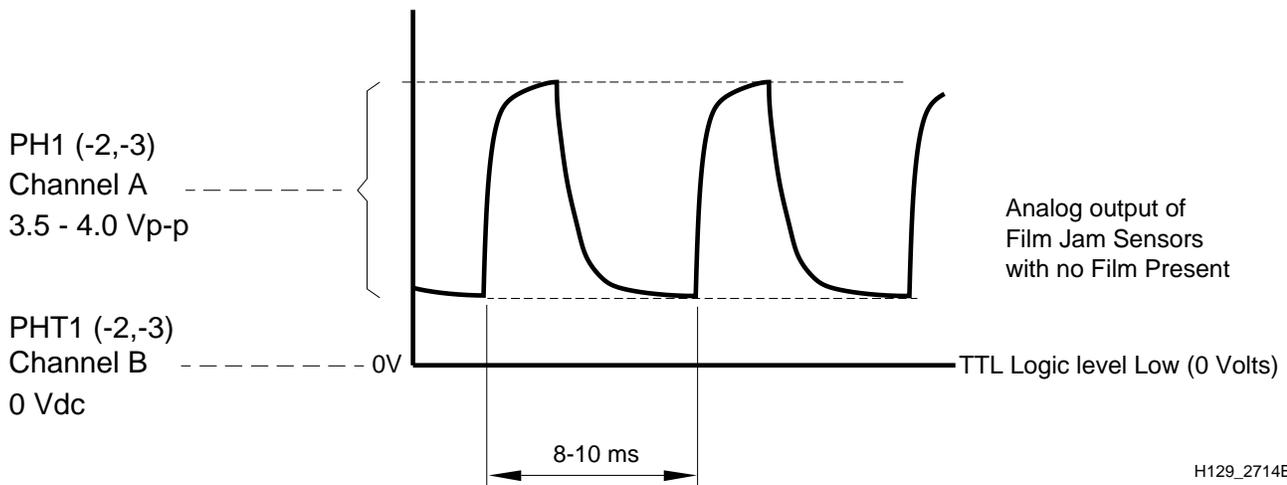
- [6] Set the Time Base to 2 ms/division.
- [7] Set the voltage to 1 volt/division.

### Note

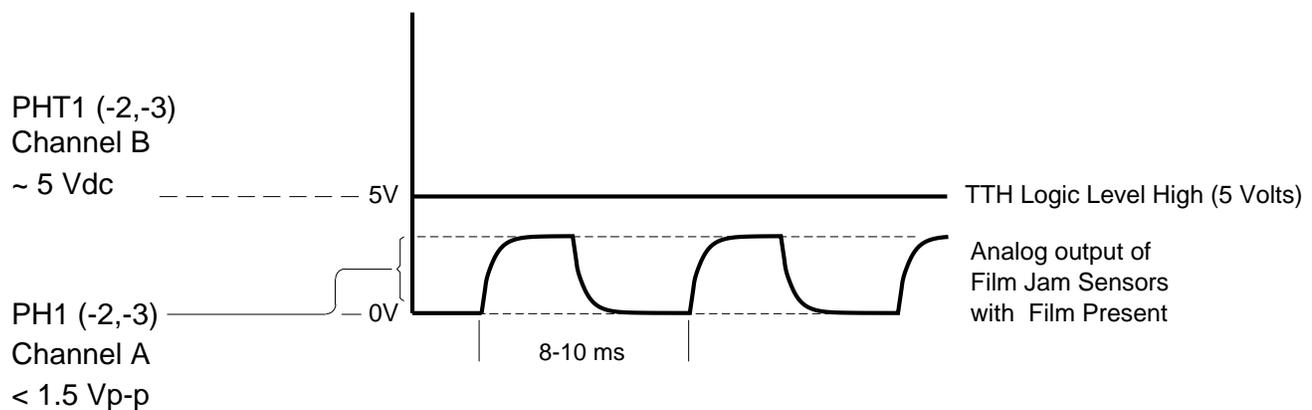
Use unprocessed film supplied by the customer.

- [8] Observe the height of the waveforms on the OSCILLOSCOPE first without FILM and then with FILM inserted between the EMITTER and RECEIVER of the SENSOR. If necessary, see the Component Locator for each SENSOR location.
  - Channel A
    - With no film: More than +3.5 V p-p
    - With film: Less than +1.5 V p-p
  - Channel B
    - With no film: 0 Vdc
    - With film: 5 Vdc

### NO FILM PRESENT



### FILM PRESENT



**To Adjust:**

[9] Rotate the correct POTENTIOMETER for each sensor until the value is within specification.

PHT2: VR1 for the SLOW SCAN FILM SENSOR

PHT3: VR2 for the FILM PROCESSOR ADAPTER FILM SENSOR

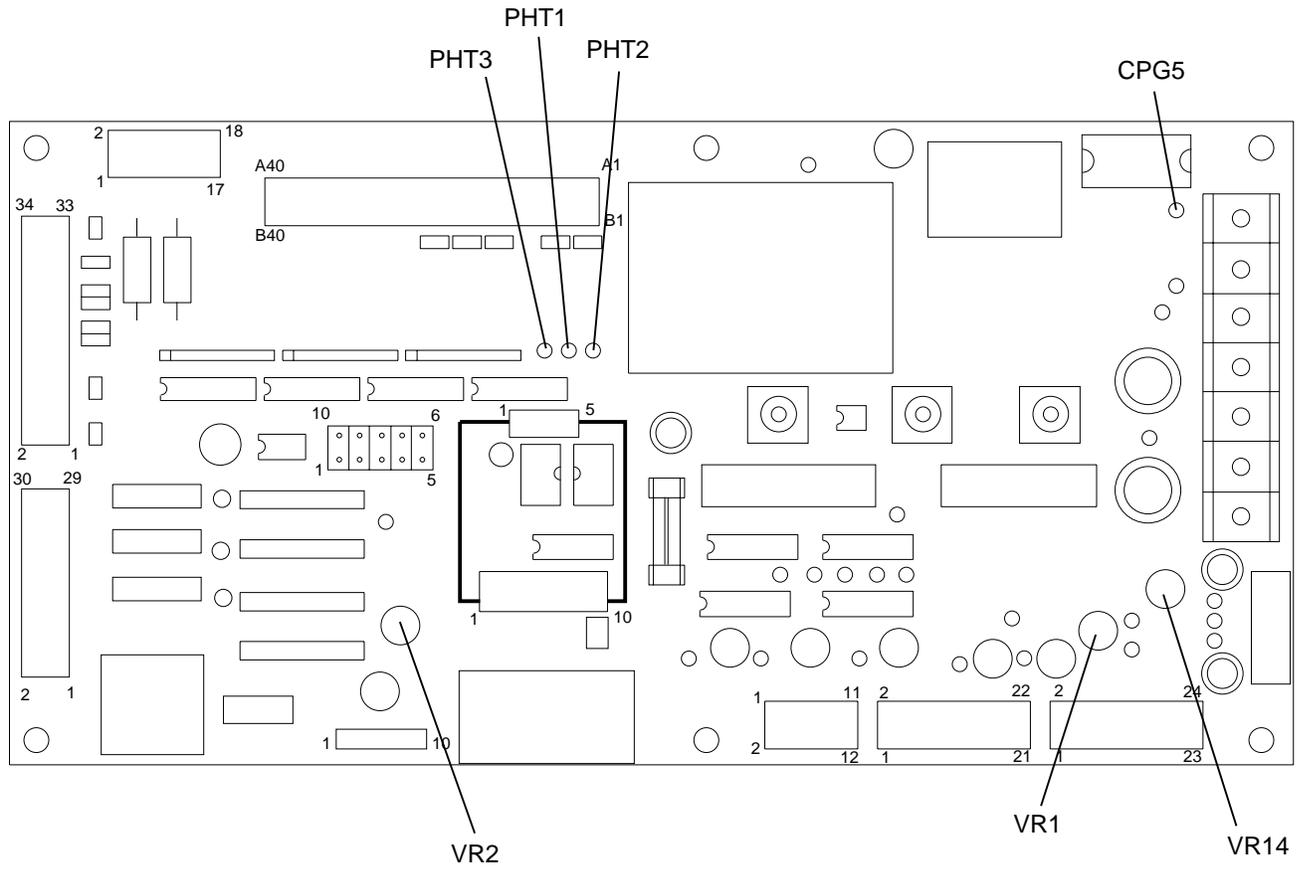
PHT1: VR14 for the TRANSPORT GUIDE PLATE JAM SENSOR

[10] Check that Channel B SENSORS show a steady DC level with no pulses. If pulses are present, do the Pulse Cycle Adjustment procedures beginning on Page 5-31.

[11] De-energize the LASER PRINTER.

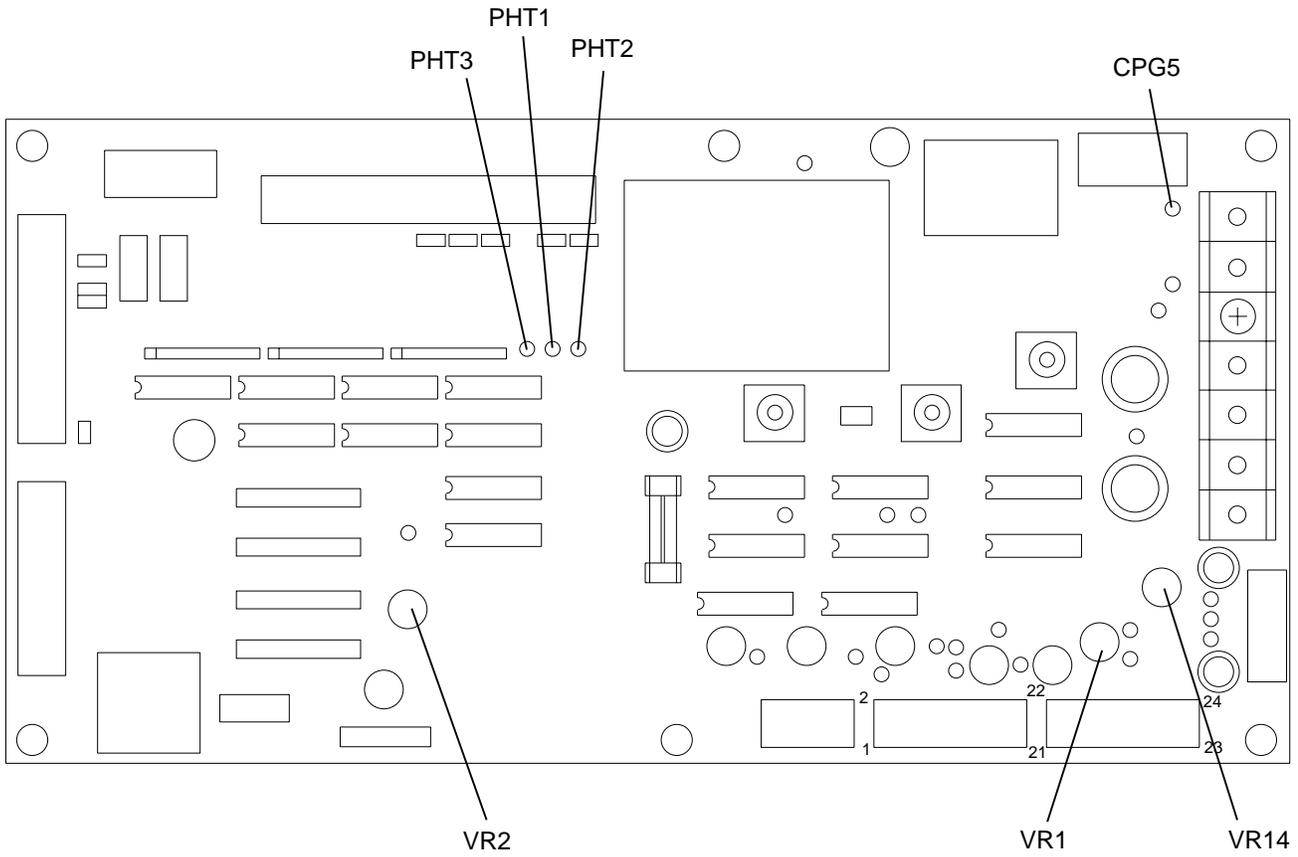
[12] Remove the OSCILLOSCOPE PROBE.

UNIVERSAL DRIVER BOARD



H129\_1726DCD  
H129\_1726DC

DRIVER BOARD (Version 5)



H129\_1724DCC  
H129\_1724DC

## No Film Signal Holding Time

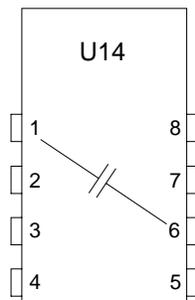
Sensor	Symbol	To observe waveform, place oscilloscope between GND and PROBE		To adjust waveform period, rotate
		CPG5	PHT2	
Slow Scan Sensor	IL1	CPG5	PHT2	VR10
Film Processor Adapter Sensor	IL2	CPG5	PHT3	VR11
Transport Sensor	IL3	CPG5	PHT1	VR12

### To Check:

[1] Disconnect J218 from the DRIVER BOARD. J218 is the flat cable that connects to the SEQUENCE BOARD.

[2] Connect the PULSE CYCLE TEST TOOL, TL-4715, to IC U14.

### Note



- U14 pin 1 and pin 6 must be connected to the TL-4715 capacitor.
- You must use TL-4715 to obtain  $30 \pm 5$  ms. at TP L:D1, LD2, and LD3.
- The tool consists of an 8-PIN DIN CLIP with a  $0.01\mu\text{f}$  CAPACITOR across pin 1 and pin 6.

H129\_1928AC

[3] Connect the Channel A OSCILLOSCOPE PROBE to the correct TEST POINT:

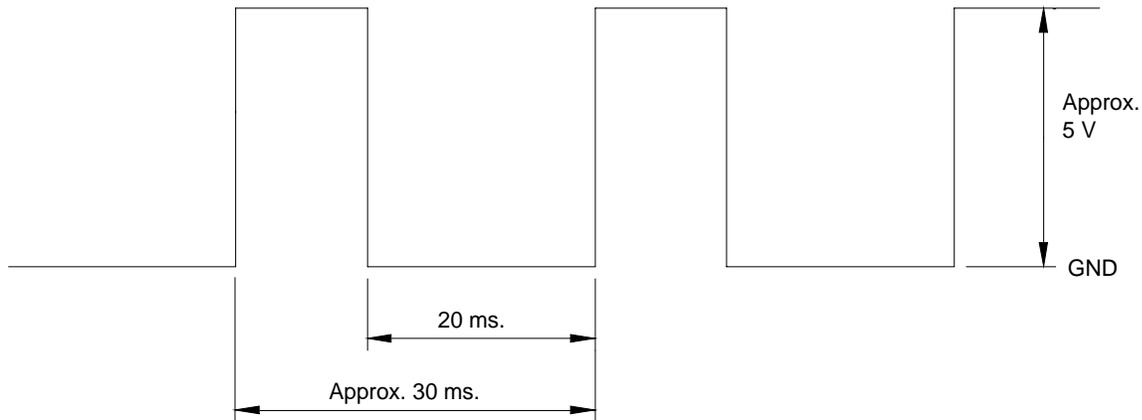
IL1: PHT2 for the SLOW SCAN FILM SENSOR

IL2: PHT3 for the FILM PROCESSOR ADAPTER FILM SENSOR

IL3: PHT1 for the TRANSPORT GUIDE PLATE FILM SENSOR

[4] Energize the LASER PRINTER.

[5] Observe the wavelength on the OSCILLOSCOPE. The pulse width should be between 20 ms and 22 ms.



H129\_1911BC

**To Adjust:**

[6] Rotate the correct POTENTIOMETER for each sensor until the value is within specification.

PHT2: VR10 for the SLOW SCAN FILM SENSOR

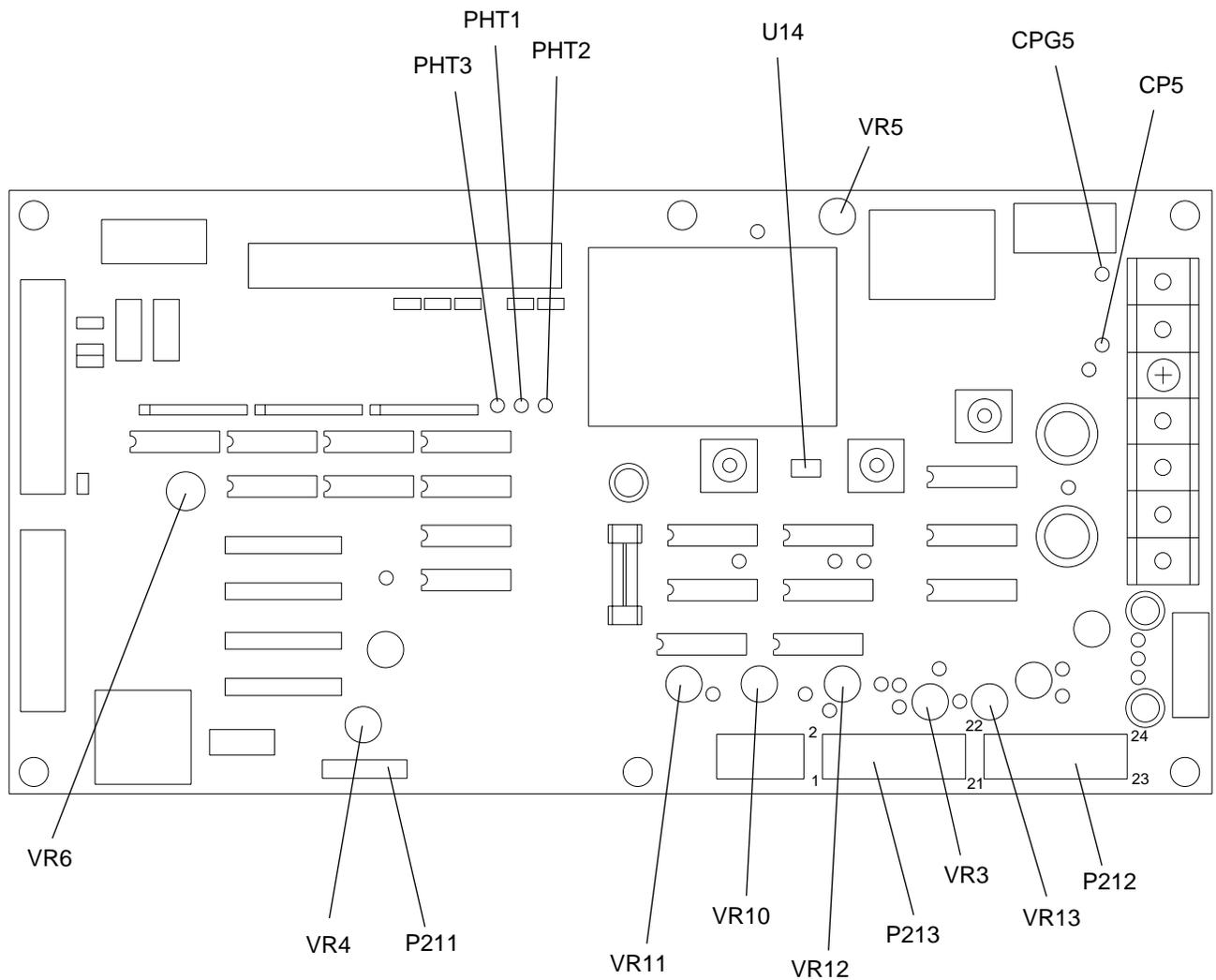
PHT3: VR11 for the FILM PROCESSOR ADAPTER FILM SENSOR

PHT1: VR12 for the TRANSPORT GUIDE PLATE JAM SENSOR

[7] Connect J218 to the SEQUENCE BOARD.

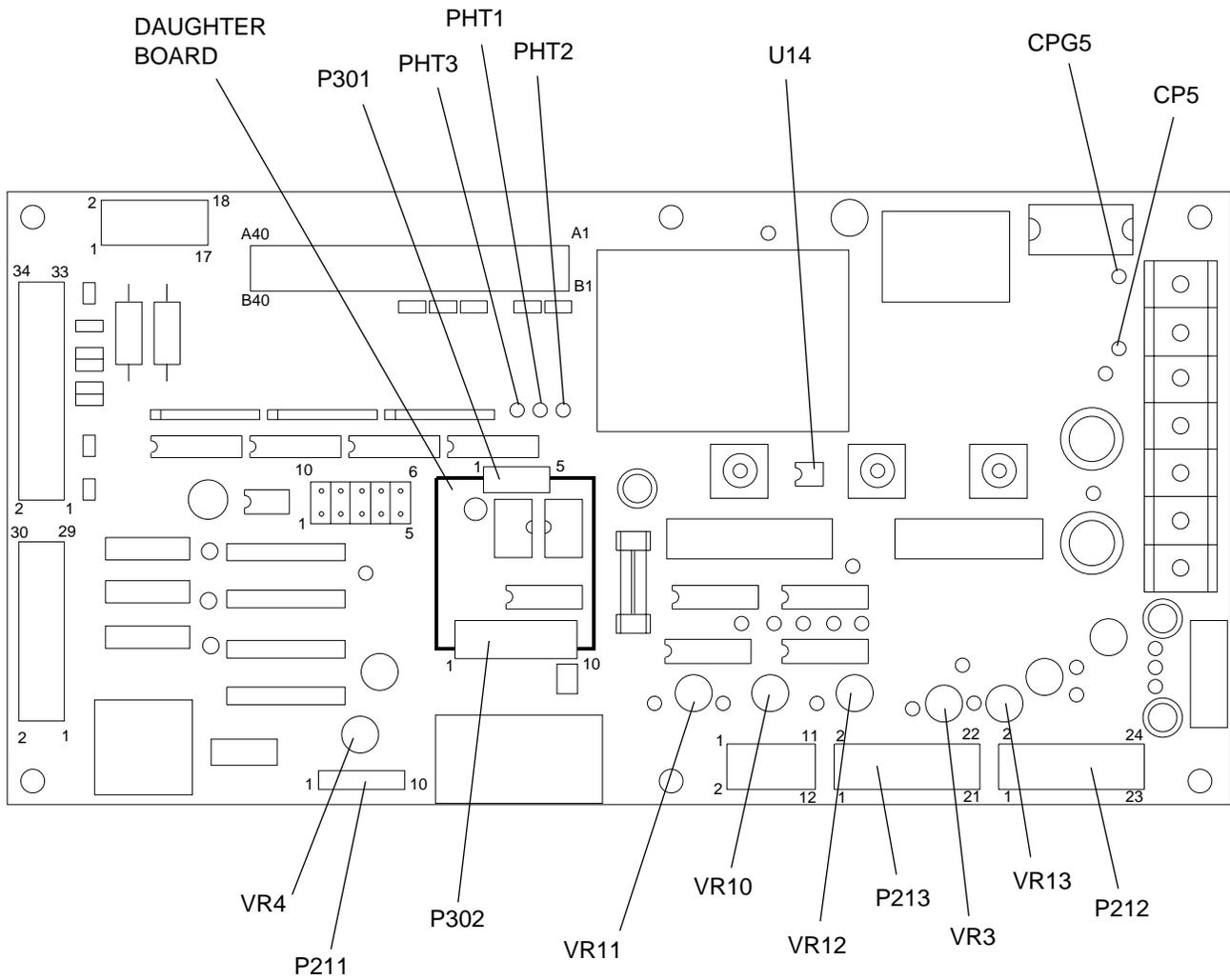
[8] Remove TL-4715.

DRIVER BOARD (Version 5)



H129\_1724DCB  
H129\_1724DC

UNIVERSAL DRIVER BOARD



H129\_1726DCB  
H129\_1726DC

## Permanent Emitter Pulse Cycle



### Important

This is a check only. There is no adjustment for the printers in this serial number range.

Sensor	Symbol	To observe waveform, place oscilloscope between GND and PROBE	
Slow Scan Sensor	IL1	CPG5	LD2
Film Processor Adapter Sensor	IL2	CPG5	LD3
Transport Sensor	IL3	CPG5	LD1

### To Check:

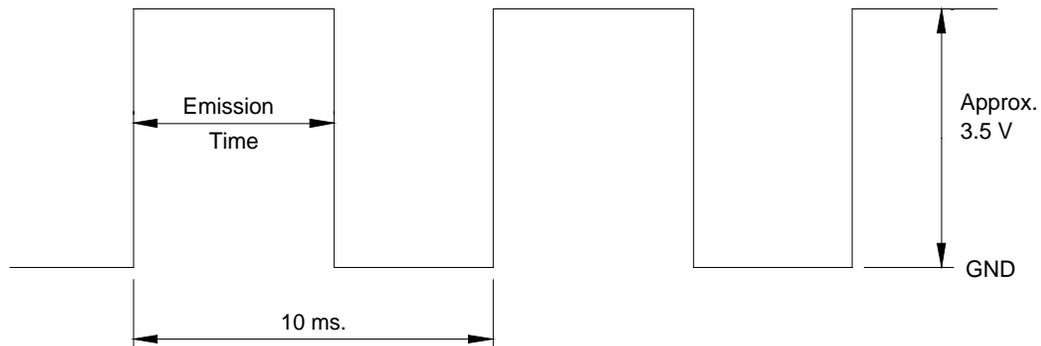
[1] Connect the Channel B OSCILLOSCOPE PROBE to the correct TEST POINT:

IL1: LD2 for the SLOW SCAN FILM SENSOR

IL2: LD3 for the FILM PROCESSOR ADAPTER FILM SENSOR

IL3: LD1 for the TRANSPORT GUIDE PLATE FILM JAM SENSOR

[2] Observe the wavelength on the OSCILLOSCOPE. The period should be between 10 ms and 12 ms.



H129\_1912BC

### Note

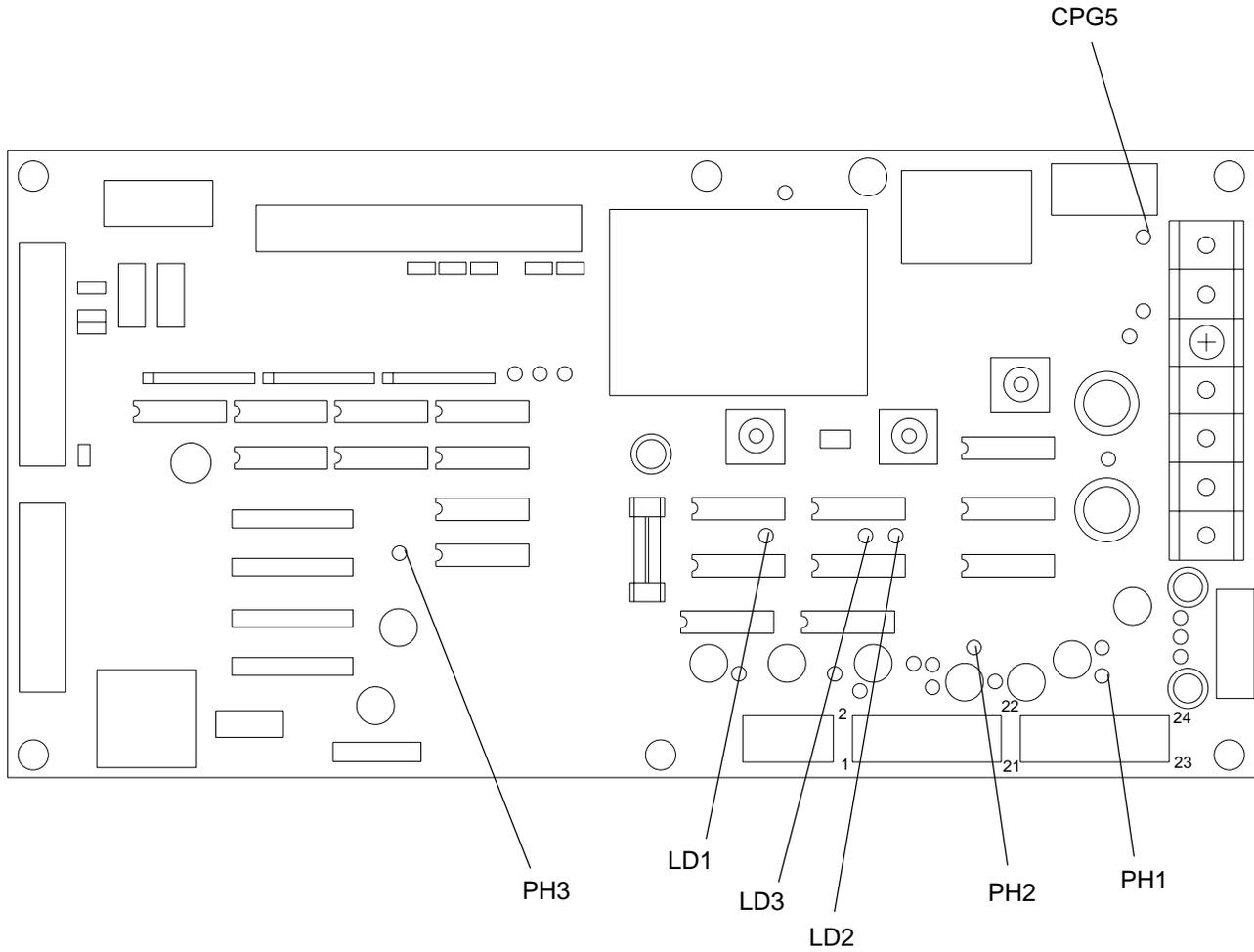
Channel A signal should be a constant low.

[3] Insert a FILM between the emitter and receiver of each sensor to see that the signal on Channel A goes high as FILM is detected.

[4] De-energize the LASER PRINTER.

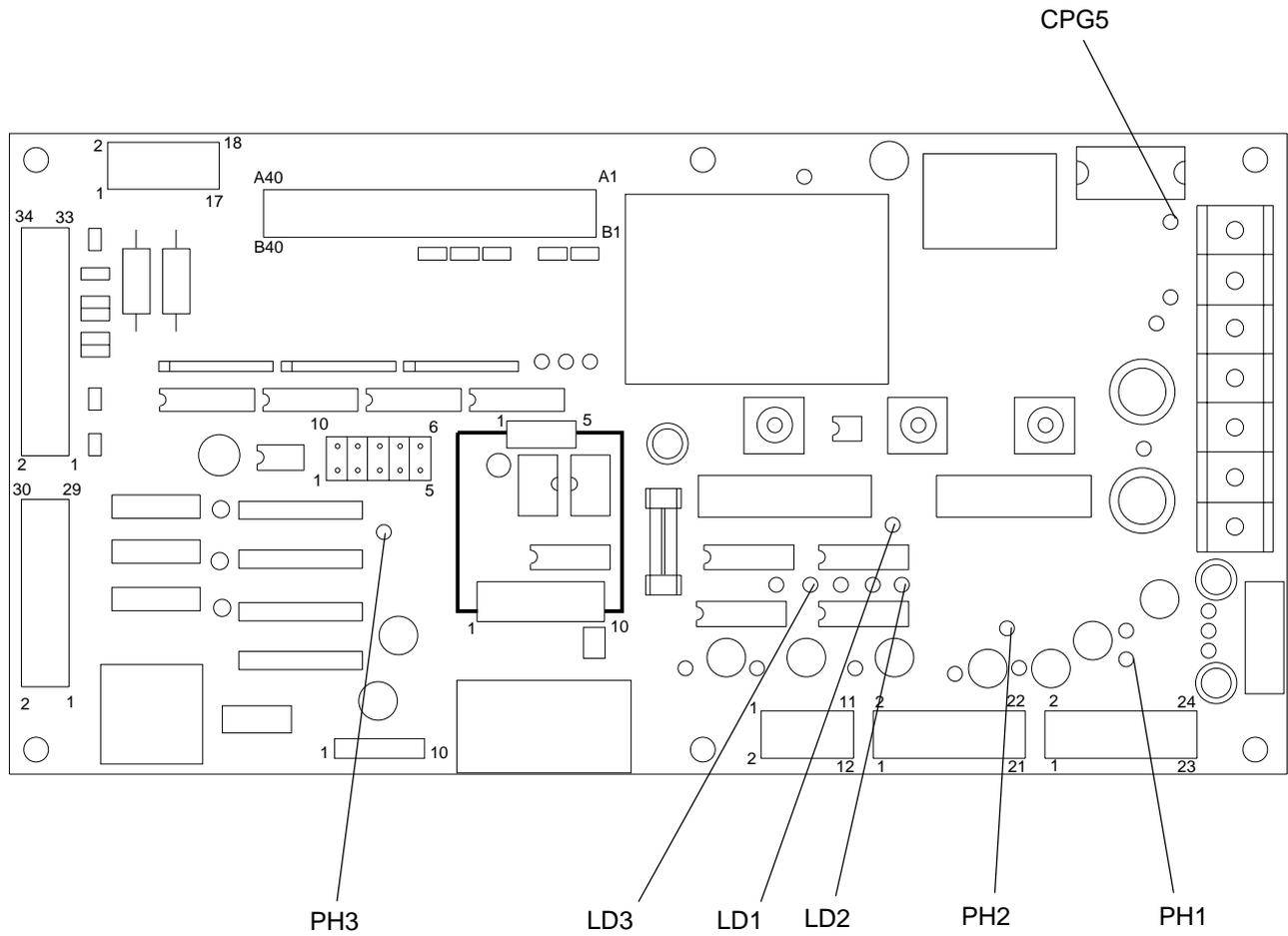
[5] Connect J218.

DRIVER BOARD (Version 5)



H129\_1724DCA  
H129\_1724DC

UNIVERSAL DRIVER BOARD



H129\_1726DCA  
H129\_1726DC

## Emitter Pulse Duty Ratio for Sensors IL1, IL2, and IL3

Duty Cycle Ratio is defined as percent of time the SENSORS are on divided by the percent of time the SENSORS are off.

Lower the Duty Cycle Ratio if film fogging has occurred. Adjusting the 3 SWITCHES changes the ratio of emitter time per cycle. The Duty Ratio may need to be changed when non-Kodak films are used.

### Note

The switches RSW1 and RSW2 on the DRIVER BOARD are factory-set to 8 for a Duty Ratio of 60%. RSW3 is factory set to 3 for a Duty Ratio of 28 percent.

PHT2, IL1 - RSW2: for the SLOW SCAN FILM SENSOR

PHT3, IL2 - RSW3: for the FILM PROCESSOR ADAPTER SENSOR

PHT1, IL3 - RSW1: for the TRANSPORT GUIDE PLATE FILM JAM SENSOR

### Note

If changing the Duty Ratio, select one of the following switch settings to select the percent shown:

Switch Setting	Duty Ratio
*0	9.4%
*1	16%
2	22%
3	28%
4	34%
5	41%
6	47%
7	53%

Switch Setting	Duty Ratio
8	60%
9	66%
*A	72%
*B	78%
*C	84%
*D	91%
*E	97%
*F	100%

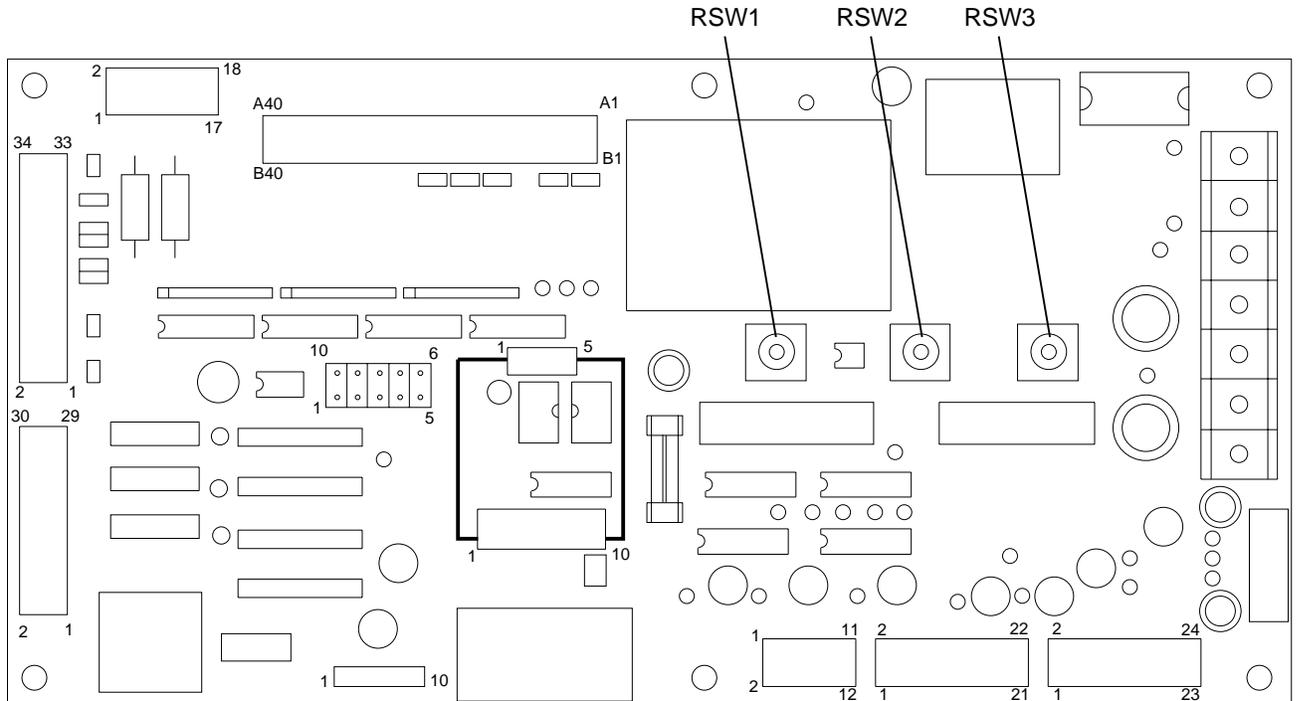
\* Not recommended.



**Important**

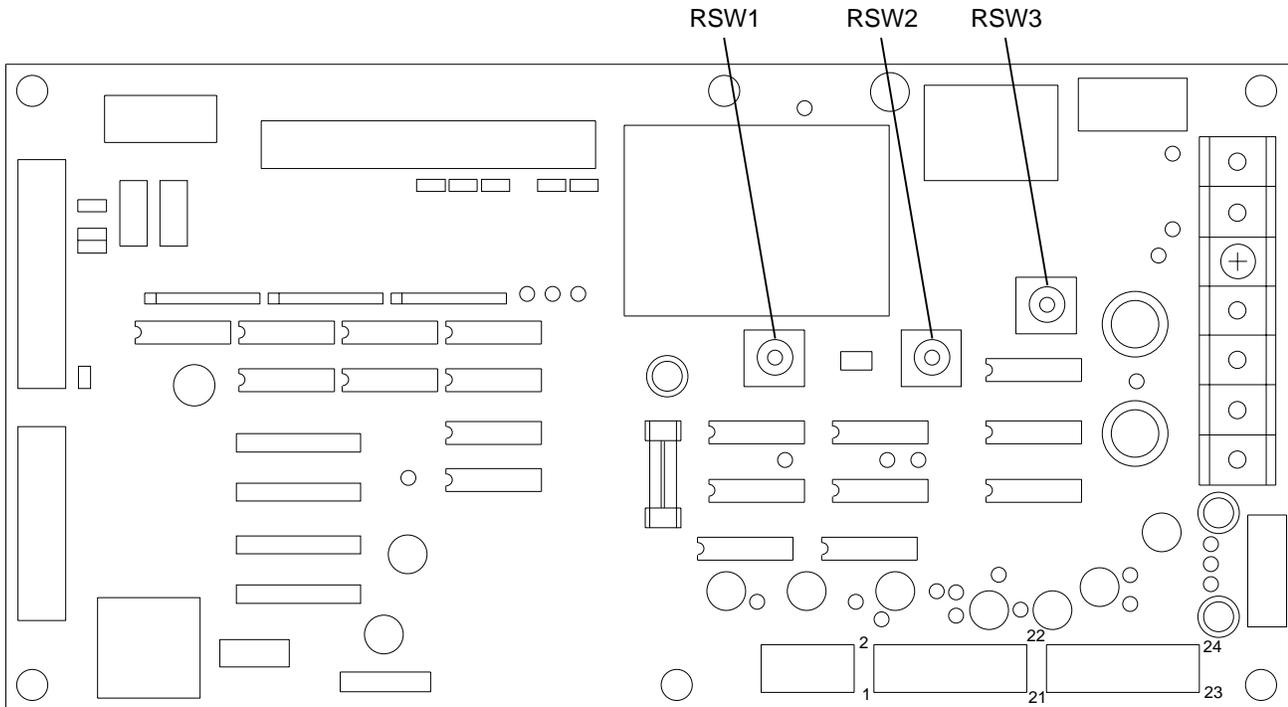
If you are changing the Duty Ratio, the Output Voltage for Receivers will need to be checked. Adjust as necessary.

**UNIVERSAL DRIVER BOARD**



H129\_1726DCE  
H129\_1726DC

DRIVER BOARD (Version 5)



H129\_1724DCD  
H129\_1724DC

- [1] Change the switch settings for each sensor by trial and error until the film-fogging problem is cleared. Use the Flat Field procedure on Page 4-21 to check the image after setting the duty ratio.
- [2] Check the receiver output voltage for PT1, PT2, or PT3 after changing the switch setting. See the procedure on Page 5-27.

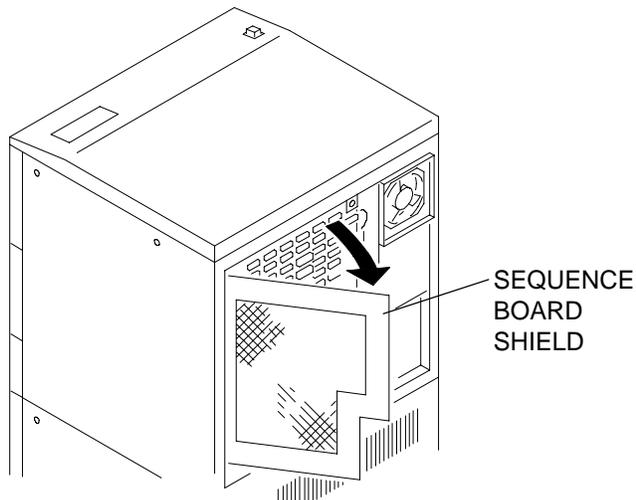
## Driver Board - Versions 6 & Higher and Serial No. Range 500899-present, 600307-present

### Note

Some Version 6 BOARDS may require SENSOR adjustments as described in the previous section.

### DC/DC Converter Output Voltage

Use this procedure to correct timing malfunctions and to restore dropped pixels on film. If the output voltage is less than -2 Vdc, the PORTABLE COMPUTER displays the “no beam detected error”.



H129\_0601ACA  
H129\_0601AC



### Caution

Close the MAGAZINE WINDOWS or remove the MAGAZINES before doing this adjustment.

### To Check:

- [1] De-energize the LASER PRINTER.
- [2] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [3] Open the SEQUENCE BOARD SHIELD.
- [4] Connect the DIGITAL MULTIMETER TL-3386:
  - (a) + side to CPM5 on the DRIVER BOARD
  - (b) COM side to CPG5 on the DRIVER BOARD.
- [5] Energize the LASER PRINTER.
- [6] Check that the voltage is  $-5.2 \pm 0.05$  Vdc.

## Film Sensor Adjustments



### Important

After energizing the PRINTER, wait at least 10 minutes before adjusting the SENSORS.

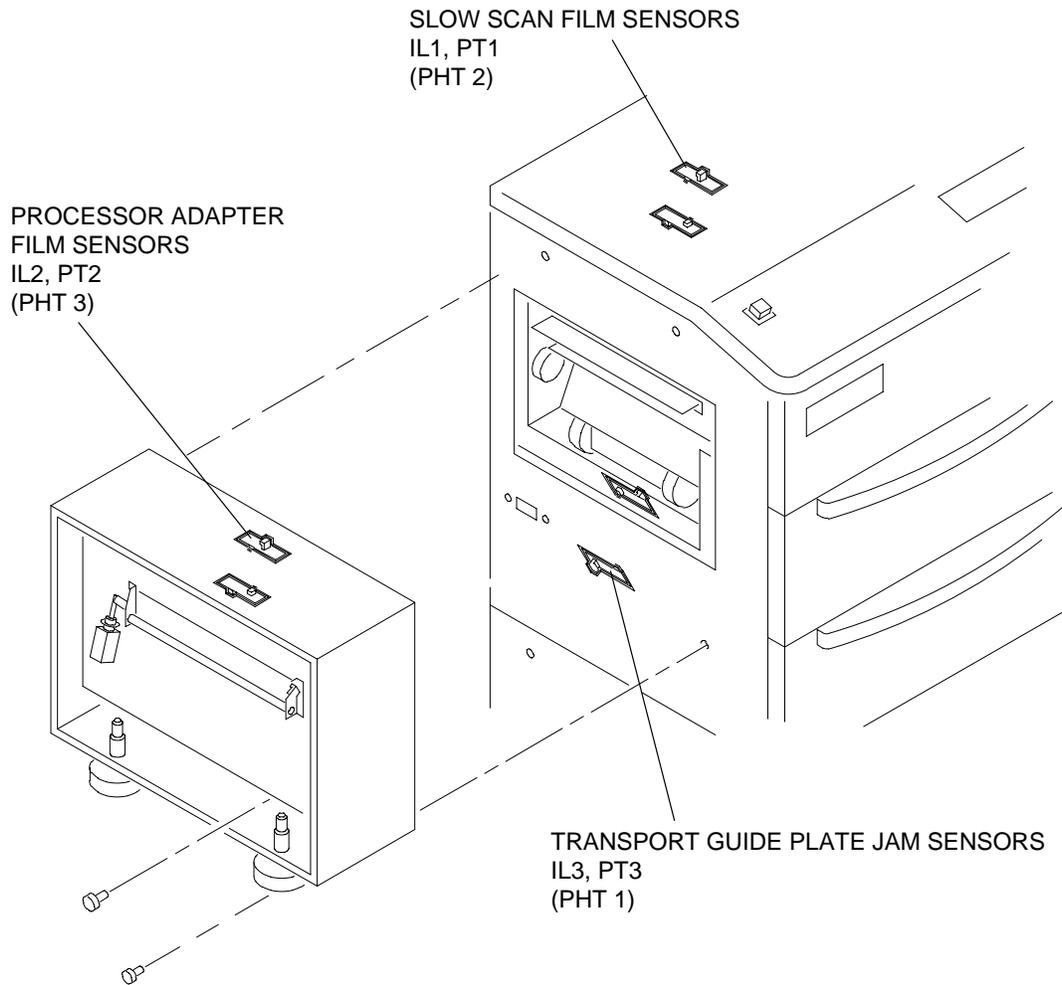
Film jam errors will occur if the voltages for the FILM SENSORS are not within the correct specification. Use this set of procedures to eliminate film jam errors caused by misadjusted, newly installed FILM SENSORS or manufacturing changes in film or other film manufacturers.



### Important

To check and adjust PHT 1,2,3, use the procedures on Pages 5-43 through 5-46. If you achieve signals shown on Page 5-45, the procedure is complete. If necessary, see the Diagnostics Manual DG3226.

Do all the FILM SENSOR Adjustments in the sequence indicated in this section.



H129\_7818DCA  
H129\_7818DC

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## Output Voltage for Receivers PT1, PT2, and PT3

This procedure is done to ensure the necessary output voltages are correct for the DRIVER BOARD to convert to a TTL level used at the SEQUENCE BOARD. It will be necessary to check this output when changing film manufacturers, replacing sensors and/or DRIVER BOARD.

### To Check:

- [1] Connect the Channel A and the Channel B GROUND CLIPS to CPG5.
- [2] Connect the Channel A OSCILLOSCOPE PROBE to the correct TEST POINT:

### Note

This gives the analog output of each FILM JAM SENSOR.

- PH2 for the SLOW SCAN FILM SENSOR
- PH3 for the FILM PROCESSOR ADAPTER FILM SENSOR
- PH1 for the TRANSPORT GUIDE PLATE FILM SENSOR

- [3] Set the Time Base to 2 ms/division.
- [4] Set the voltage to 1 volt/division.
- [5] Connect the Channel B OSCILLOSCOPE PROBE to the correct TEST POINT:

### Note

This shows the TTL levels for each FILM JAM SENSOR as converted by the DRIVER BOARD.

- PHT2 for the SLOW SCAN FILM SENSOR
- PHT3 for the FILM PROCESSOR ADAPTER FILM SENSOR
- PHT1 for the TRANSPORT GUIDE PLATE FILM SENSOR



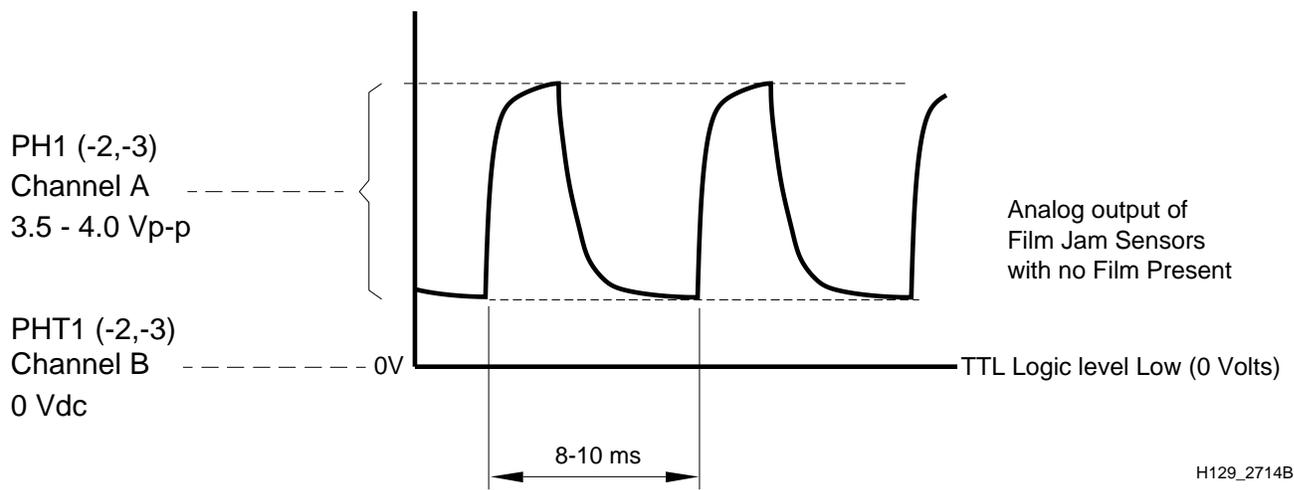
**Note**

Use unprocessed film supplied by the customer.

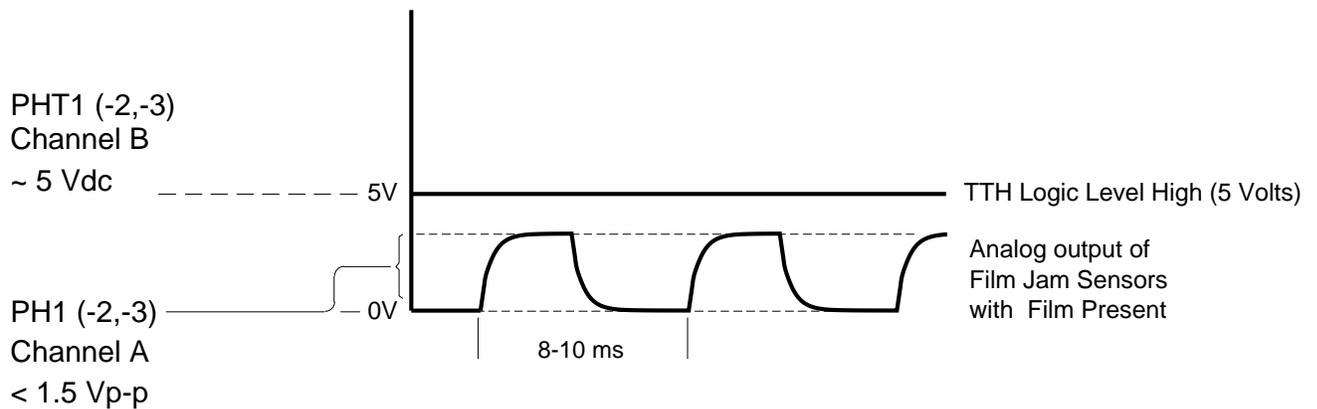
[6] Observe the height of the waveforms on the OSCILLOSCOPE first without FILM and then with FILM inserted between the EMITTER and RECEIVER of the SENSOR. If necessary, see the Component Locator for each SENSOR location.

- Channel A
  - With no film: More than +3.5 V p-p
  - With film: Less than +1.5 V p-p
- Channel B
  - With no film: 0 Vdc
  - With film: 5 Vdc

**NO FILM PRESENT**



**FILM PRESENT**



**To Adjust:**

[7] Rotate the correct POTENTIOMETER for each sensor until the value is within specification.

PHT2: VR1 for the SLOW SCAN FILM SENSOR

PHT3: VR2 for the FILM PROCESSOR ADAPTER FILM SENSOR

PHT1: VR14 for the TRANSPORT GUIDE PLATE JAM SENSOR

[8] Check that Channel B SENSORS show a steady DC level with no pulses.

[9] De-energize the LASER PRINTER.

[10] Remove the OSCILLOSCOPE PROBE.

Oscilloscope Connection to Driver Board			Adjustment
Channel B	Channel A	Ground Point	Potentiometer
PHT2	PH2	CPG5	VR1
PHT3	PH3	CPG5	VR2
PHT1	PH1	CPG5	VR14

## Emitter Pulse Duty Ratio for Sensors IL1, IL2, and IL3

Duty Cycle Ratio is defined as percent of time the SENSORS are on divided by the percent of time the SENSORS are off.

Lower the Duty Cycle Ratio if film fogging has occurred. Adjusting the 3 SWITCHES changes the ratio of emitter time per cycle. The Duty Ratio may need to be changed when non-Kodak films are used.

### Note

The switches RSW1 and RSW2 on the DRIVER BOARD are factory-set to 8 for a Duty Ratio of 60%. RSW3 is factory set to 3 for a Duty Ratio of 28 percent.

PHT2, IL1 - RSW2: for the SLOW SCAN FILM SENSOR

PHT3, IL2 - RSW3: for the FILM PROCESSOR ADAPTER SENSOR

PHT1, IL3 - RSW1: for the TRANSPORT GUIDE PLATE FILM JAM SENSOR

### Note

If changing the Duty Ratio, select one of the following switch settings to select the percent shown:

Switch Setting	Duty Ratio	Switch Setting	Duty Ratio
*0	9.4%	8	60%
*1	16%	9	66%
2	22%	*A	72%
3	28%	*B	78%
4	34%	*C	84%
5	41%	*D	91%
6	47%	*E	97%
7	53%	*F	100%

\* Not recommended.

### Important

If you are changing the Duty Ratio, the Output Voltage for Receivers will need to be checked. Adjust as necessary.

## DRIVER BOARD

- [1] Change the switch settings for each sensor by trial and error until the film-fogging problem is cleared. Use the Flat Field procedure on Page 4–21 to check the image after setting the duty ratio.
- [2] Check the receiver output voltage for PT1, PT2, or PT3 after changing the switch setting. See the procedure on Page 5–43.

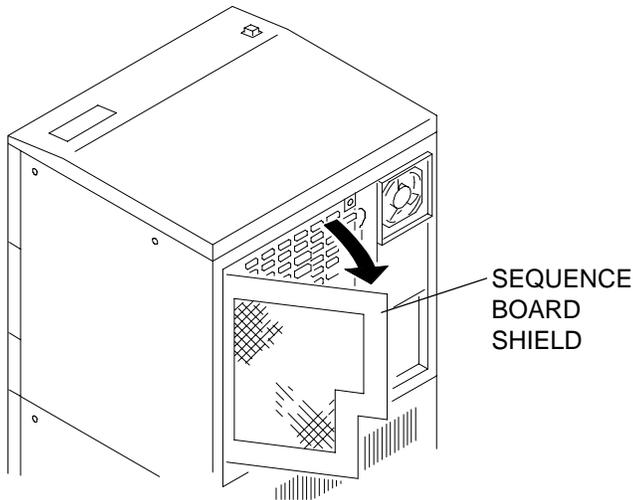
## Sequence Board

### Beam Detector Signal Offset Voltage

Use this procedure when receiving 53 Beam Detect errors and/or replacing the SEQUENCE BOARD.

#### Note

This adjustment has been discontinued for SEQUENCE BOARDS labeled with Cannon Part No. BH8-1266-03I to M (1120 Serial No. Range 500895-502079 and 600307-602025) and BH8-1266-04 (1120 Serial No. Range 502080-present and 602026-present).



H129\_0601ACA  
H129\_0601AC

#### To Check:

- [1] De-energize the LASER PRINTER.
- [2] Install the PORTABLE COMPUTER. See “Using the Portable Computer” in the Diagnostic Section.
- [3] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [4] Open the SEQUENCE BOARD SHIELD.

[5] Connect the DIGITAL MULTIMETER TL-3386 as follows:

- + side to CP14 on the SEQUENCE BOARD
- COM side to CP8 on the SEQUENCE BOARD.

[6] Energize the LASER PRINTER.

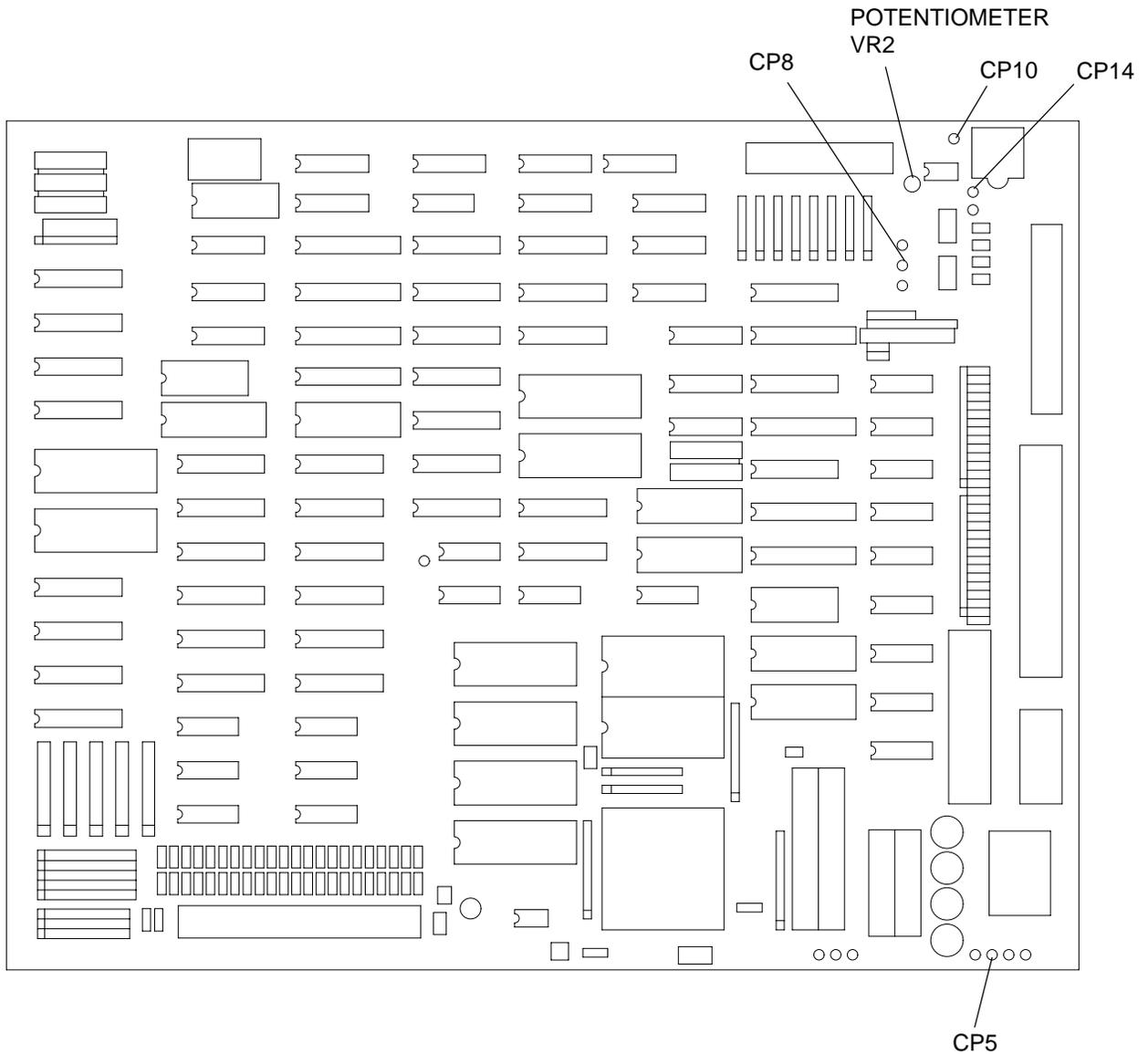
[7] Check that the voltage on the DIGITAL MULTIMETER is  $0.75 \text{ Vdc} \pm 0.02$ .

#### To Adjust:

[8] Rotate POTENTIOMETER VR2 until the voltage is within specification.

[9] Remove MULTIMETER PROBES.

SEQUENCE BOARD



H129\_1705DCA  
H129\_1705DC

```

MAIN MENU

1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit

Enter Menu Item:
    
```

**[10]** Use the PORTABLE COMPUTER to display the CES Main Menu.

```

MONITOR MODE MENU

1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test

Enter Menu Item:
    
```

**[11]** Enter [1] for "Monitor Mode".

Input 'HLP' to know commands.  
Enter command:

Enter Command: LDO

Enter Command: PON

[12] Enter [7] for “Enter Commands”.

**Note**

- Commands must be entered using capital letters.
- See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.

[13] Enter [L] [D] [O] to energize the laser.

[14] Enter [P] [O] [N] to energize the POLYGON MOTOR.

[15] Connect a 10X PROBE TL-2074 to the Channel A input of the OSCILLOSCOPE TL-3348.

[16] Connect the GROUND CLIP of the OSCILLOSCOPE PROBE in Channel A to CP5 on the SEQUENCE BOARD.

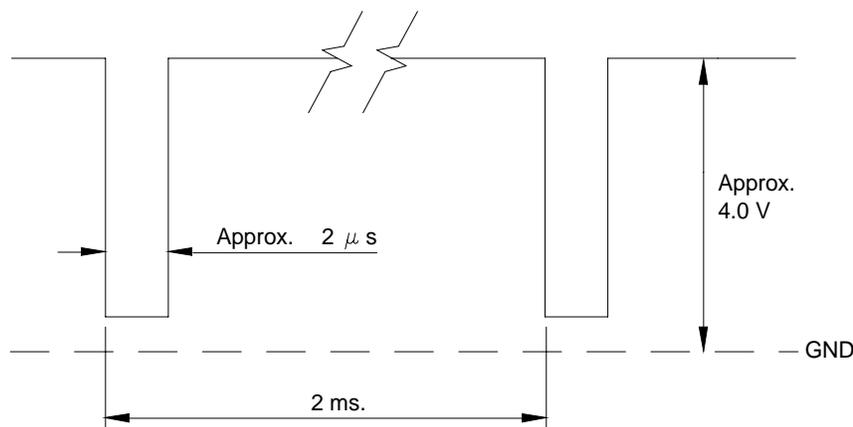
[17] Connect the 10X OSCILLOSCOPE PROBE in Channel A to CP10 on the SEQUENCE BOARD.

[18] Set the Channel A to 1.0 Volt/Div.

[19] Set the Sec/Div.:

- (a) To measure the low pulse width, set the knob to 1  $\mu$ s/Div.
- (b) To measure the high pulse width, set the knob to 1 ms/Div.

[20] Check that the waveform on the OSCILLOSCOPE is the same as the waveform below.



H129\_1915BC

```
error=0  
Enter Command:LDF
```

```
error=0  
Enter Command:POF
```

**To Adjust:**

- [21] Rotate the POTENTIOMETER VR2 until the voltage and waveform are correct.
- [22] Enter [L] [D] [F] to turn off the Laser Diode.
- [23] Enter [P] [O] [F] to turn off the Polygon Motor.
- [24] Press [ESC] 3 times to exit diagnostics.
- [25] Remove the OSCILLOSCOPE PROBE.
- [26] Close the SEQUENCE BOARD SHIELD COVER.
- [27] Replace the BACK IMAGE UNIT COVER.

## **5-Phase Pulse Motor Boards for the Transport Motor Voltages (5PMD)**

Use this procedure after installing a new TRANSPORT ROLLER DRIVER BOARD, SUPPLY ROLLER DRIVER BOARD, or RECEIVE ROLLER DRIVER BOARD. The 3 FILM TRANSPORT MOTORS in the LASER PRINTER operate with the same type of circuit board, the 5-PHASE PULSE MOTOR BOARD.

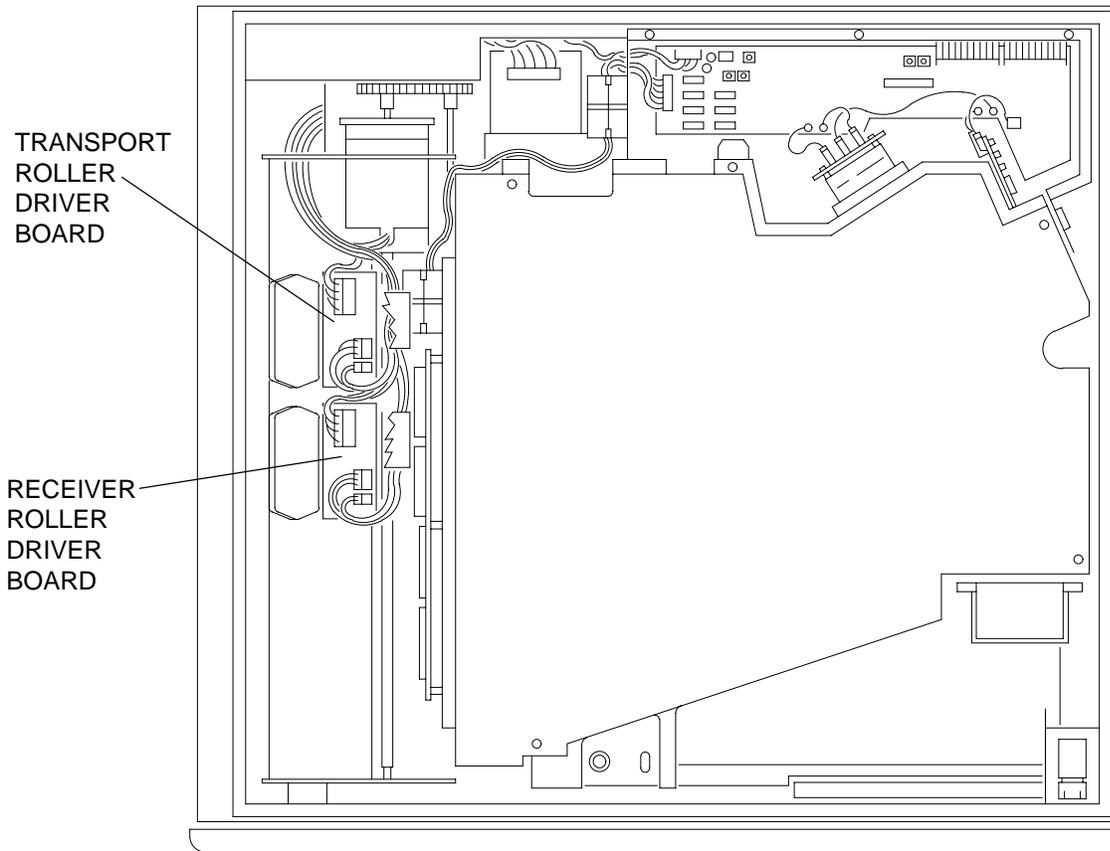
### **Note**

**There are four versions of the 5-Phase MOTOR BOARD. The version illustrated here contains checks and adjustments and may be interchanged between the TRANSPORT ROLLER DRIVER BOARD, SUPPLY ROLLER DRIVER BOARD, and/or RECEIVE ROLLER DRIVER BOARD with correct adjustment. The three new versions contain no adjustments and are specific to each BOARD. They cannot be interchanged. Service Parts Management will stock the adjustable style for a universal approach.**

### **To Check:**

- [1] Install the PORTABLE COMPUTER. See “Using the Portable Computer” in the Diagnostic Section.
- [2] De-energize the LASER PRINTER.
- [3] Remove the correct COVERS for the CIRCUIT BOARD being adjusted.
  - (a) Remove the TOP COVER for the TRANSPORT ROLLER DRIVER BOARD and RECEIVE ROLLER DRIVER BOARD.

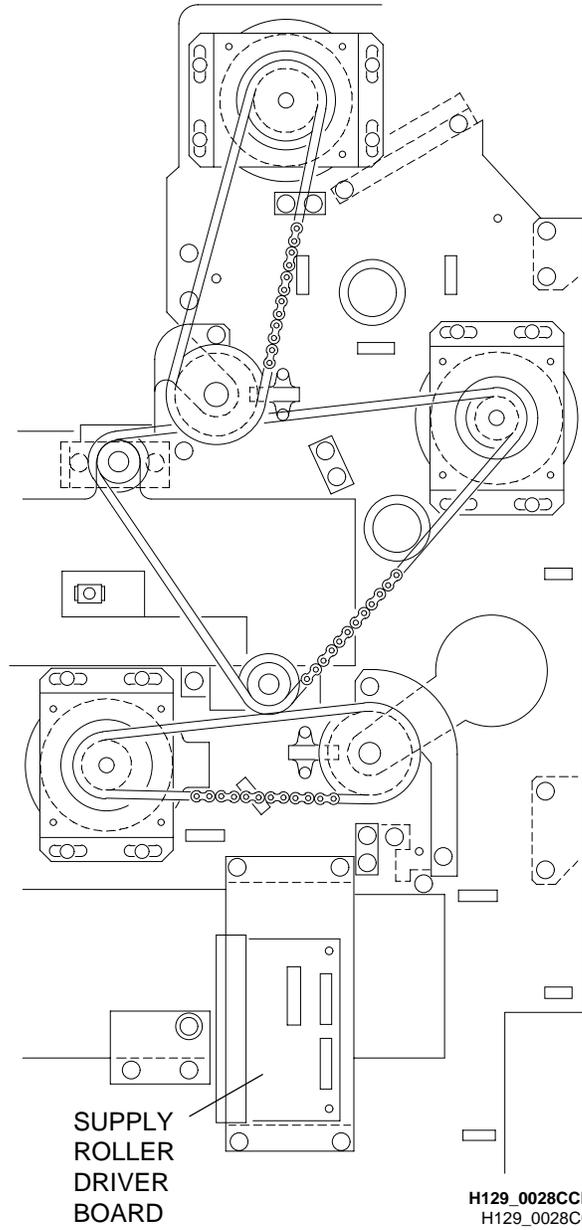
**TOP IMAGE UNIT**



H129\_1000DCC  
H129\_1000DC

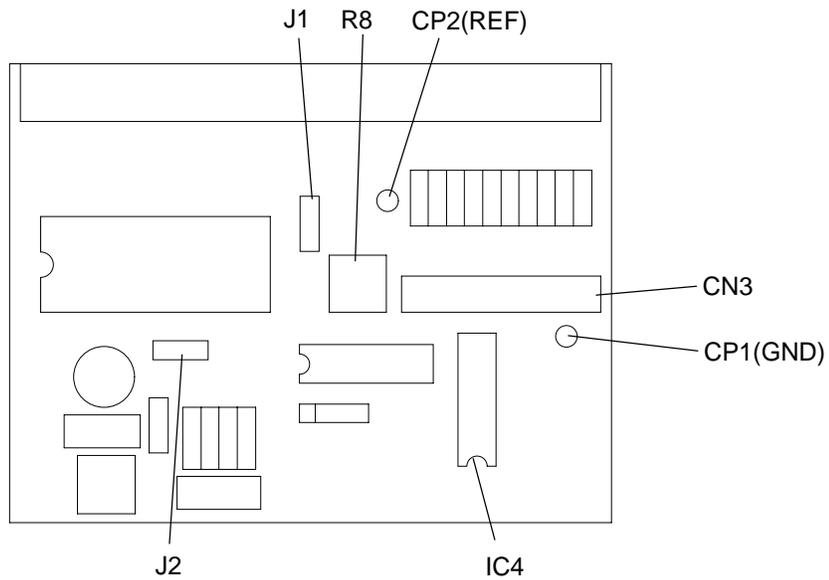
**(b)** Remove the BACK IMAGE UNIT COVER for the SUPPLY ROLLER DRIVER BOARD.

BACK IMAGE UNIT



[4] Disconnect CN3 from the 5-PHASE PULSE MOTOR BOARD.

**5-PHASE PULSE MOTOR BOARD**



P129\_1703BCA  
H129\_1703BC

[5] Check that a JUMPER is installed from J1-2 to J1-3.

[6] Check that a JUMPER is installed from J2-2 to J2-3.

[7] Remove IC4.

[8] Connect the + side of the DIGITAL MULTIMETER, TL-3386, to CP2 (REF) and the COM side to CP1 (GND).

[9] Energize the LASER PRINTER.

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit
Enter Menu Item:
    
```

[10] Use the PORTABLE COMPUTER to display the CES Main Menu.

```

MONITOR MODE MENU
1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test
Enter Menu Item:
    
```

[11] Enter [1] for "Monitor Mode".

```

MOTOR DIAG MENU
1 Beam-splitter Pulse  6 Slow Scan
2 T-roller Pulse      7 Polygon
3 S-roller Pulse      8 S-mag
4 R-roller Pulse      9 R-mag
5 Film feeder Pulse   10 Fan
Enter menu item:
    
```

[12] Enter [1] for motors.

```
X-MOTOR PULSE MOTOR DIAG MENU
1 Drive
2 Stop

Enter menu item:
```

- [13] Enter the number for the MOTOR being checked:
  - 2: T-roller PM
  - 3: S-roller PM
  - 4: R-roller PM

```
X-MOTOR PULSE MOTOR DIAG MENU
1 Drive
2 Stop

Enter menu item: 1
```

- [14] Enter [1] to energize the MOTOR.
- [15] Enter [1] for the number of pulses.
- [16] Enter [1] [0] for the speed.

```
How many pulses? (-30000 - 30000): 1
Speed? (10-1500pps): 10
```



**Important**

Be sure to use the appropriate voltage specification given in Step 17 for the board being replaced.

- [17] Check that the voltage is within specification:

- TRANSPORT ROLLER MOTOR BOARD: +0.14 Vdc to +0.15 Vdc
- SUPPLY ROLLER MOTOR BOARD: +0.20 Vdc to +0.25 Vdc
- RECEIVE ROLLER MOTOR BOARD: +0.26 Vdc to +0.31 Vdc

**To Adjust:**

- [18] Rotate POTENTIOMETER R8 until the voltage is correct.

```
X-MOTOR PULSE MOTOR DIAG MENU
1 Drive
2 Stop

Enter menu item: 2
```

- [19] Enter [2] to de-energize the MOTOR.
- [20] Press [ESC] 4 times to exit diagnostics.
- [21] De-energize the LASER PRINTER.
- [22] Replace CN3 on the CIRCUIT BOARD.
- [23] Replace IC4 on the CIRCUIT BOARD.
- [24] Replace the COVERS.

## 2-Phase Pulse Motor Board (2PMD), Slide Base Motor Voltage

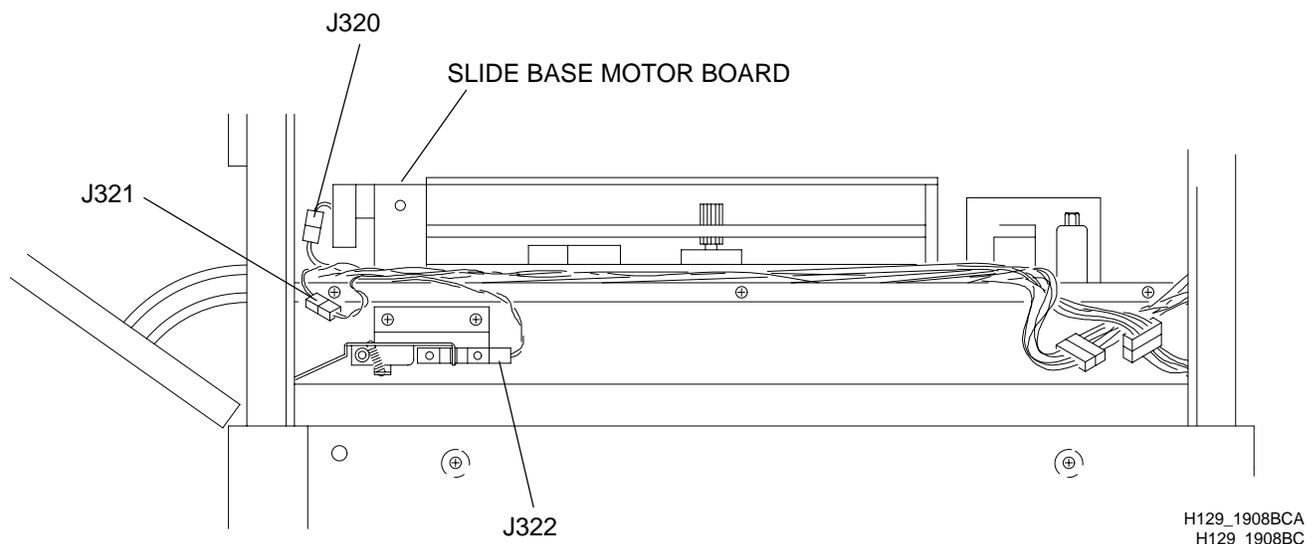
Use this procedure after installing a new SLIDE BASE MOTOR BOARD. The SLIDE BASE MOTOR and the BEAM SPLITTER MOTOR operate with the same type of circuit board, the 2-Phase Pulse Motor Board. There are no electrical adjustments for the BEAM SPLITTER MOTOR BOARD.

### Note

There are three versions of the 2PMD. The version depicted here contains checks and adjustments. This version can also be used for the SLIDE BASE MOTOR and BEAM SPLITTER MOTOR. The other two versions do not have adjustments and cannot be interchanged between the SLIDE BASE MOTOR and BEAM SPLITTER MOTOR.

### To Check:

- [1] Remove the SUPPLY MAGAZINE.
- [2] De-energize the LASER PRINTER.
- [3] Remove the RIGHT IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [4] Disconnect the following connectors:
  - J320
  - J321
  - J322
- [5] Remove the 3 SCREWS and pull the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY forward until the SLIDE BASE MOTOR BOARD is in view.
- [6] If installing a new SLIDE BASE MOTOR BOARD, check that the following JUMPERS have been installed:
  - J1-2 to J1-3
  - J2-1 to J2-2.



- [7] Disconnect P102 on the SLIDE BASE MOTOR BOARD.
- [8] Connect the + side of the DIGITAL MULTIMETER, TL-3386, to CP2 (REF) and the COM side to CP1 (GND).
- [9] Energize the LASER PRINTER.

```
MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit
Enter Menu Item:
```

[10] Use the PORTABLE COMPUTER to display the CES Main Menu.

```
MONITOR MODE MENU
1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test
Enter Menu Item:
```

[11] Enter [1] for "Monitor Mode".

```
MOTOR DIAG MENU
1 Beam-splitter Pulse  6 Slow Scan
2 T-roller Pulse      7 Polygon
3 S-roller Pulse      8 S-mag
4 R-roller Pulse      9 R-mag
5 Film Feeder Pulse   10 Fan
Enter menu item:
```

[12] Enter [1] for motors.

```
FILM FEEDER PULSE MOTOR DIAG MENU
1 Drive
2 Stop
Enter menu item: 1
```

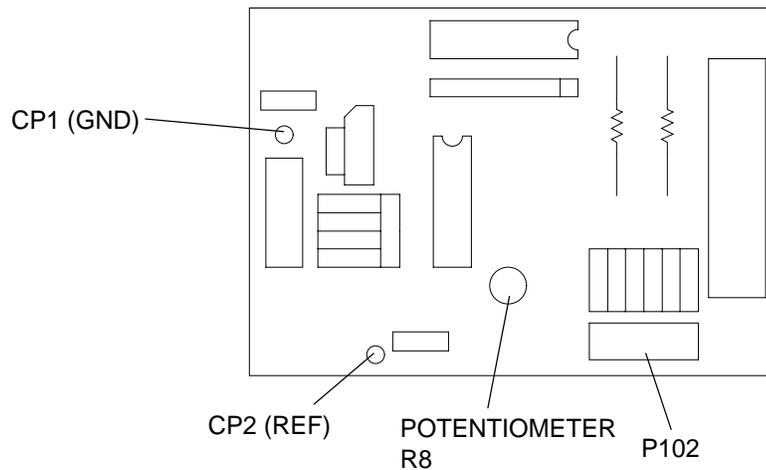
[13] Enter [5] for Film Feeder Pulse.

[14] Enter [1] to energize the motor.

[15] Enter [1] for the number of pulses.

[16] Enter [1] [0] for the speed.

```
How many pulses? (-30000 - 30000): 1
Speed? (10-1500pps): 10
```

**2-PHASE PULSE MOTOR DRIVER BOARD (2PMD)**

H129\_1704BCA  
H129\_1704BC

[17] Check that the voltage is between +1.15 and +1.20 Vdc.

**To Adjust:**

[18] Rotate potentiometer R8 until the voltage is correct.

```
X-MOTOR PULSE MOTOR DIAG MENU
1 Drive
2 Stop

Enter menu item: 2
```

[19] Enter [2] to de-energize the MOTOR.

[20] Replace P102 on the SLIDE BASE MOTOR BOARD.

[21] Replace the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY and 3 SCREWS.

[22] Replace the following connectors:

- J320
- J321
- J322

[23] Replace the RIGHT IMAGE UNIT COVER.

## Laser Diode Control Board

### Setting Laser Diode Control for D-Min

Use this procedure when the Internal Test Print contains random, black dots in the D-MIN area, or if horizontal black lines appear on the test print. This adjustment is required to set D-Min to just above the threshold current of the Laser Diode, which is seen at TP17.

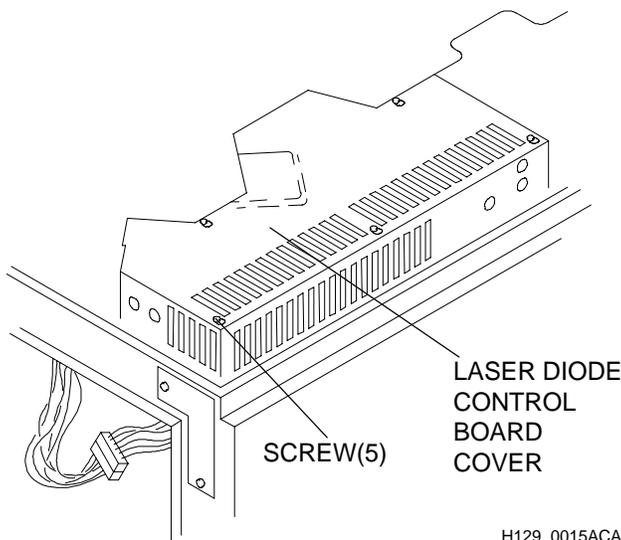
 **Note**

There are 3 styles of the LASER DIODE CONTROL BOARD. These BOARDS are STYLE -02/-03 and STYLE -07. STYLE -07 does not have a PORCH BOARD.

**To Check:**

- [1] De-energize the LASER PRINTER.
- [2] Remove the TOP COVER. If necessary, see the procedure on Page 2-5.

- [3] Loosen the 5 SCREWS and remove the LASER DIODE CONTROL BOARD COVER.

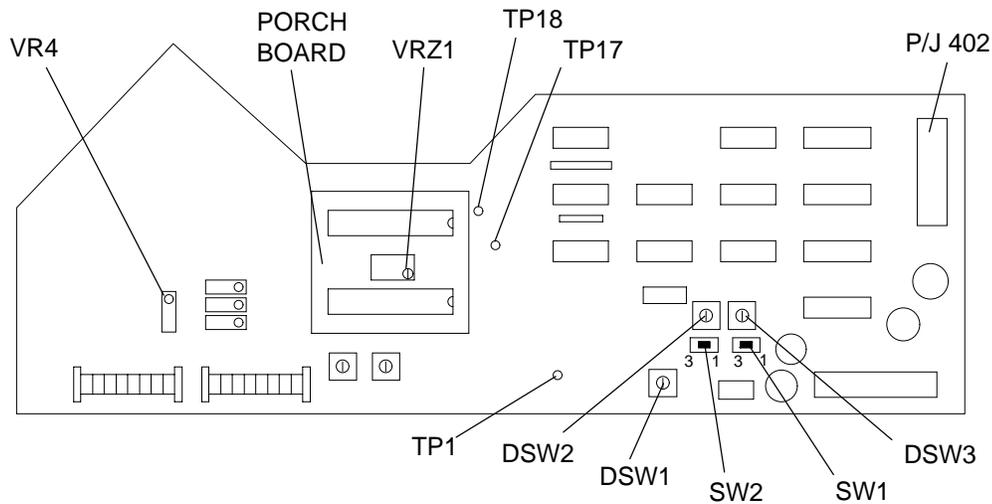


H129\_0015ACA  
H129\_0015AC

- [4] Connect one 10X Probe TL-2074 to the Channel A input of the Oscilloscope TL-3348.
- [5] Connect a second 10X Probe TL-2074 to the Channel B input of the Oscilloscope TL-3348.
- [6] Set the Time Base to 50ns/div.
- [7] Set the Voltage to 500 mV/div.
- [8] Set the Trigger to Ch. A, +slope.
- [9] Set the LDC Board Switches as noted in the table at the right.

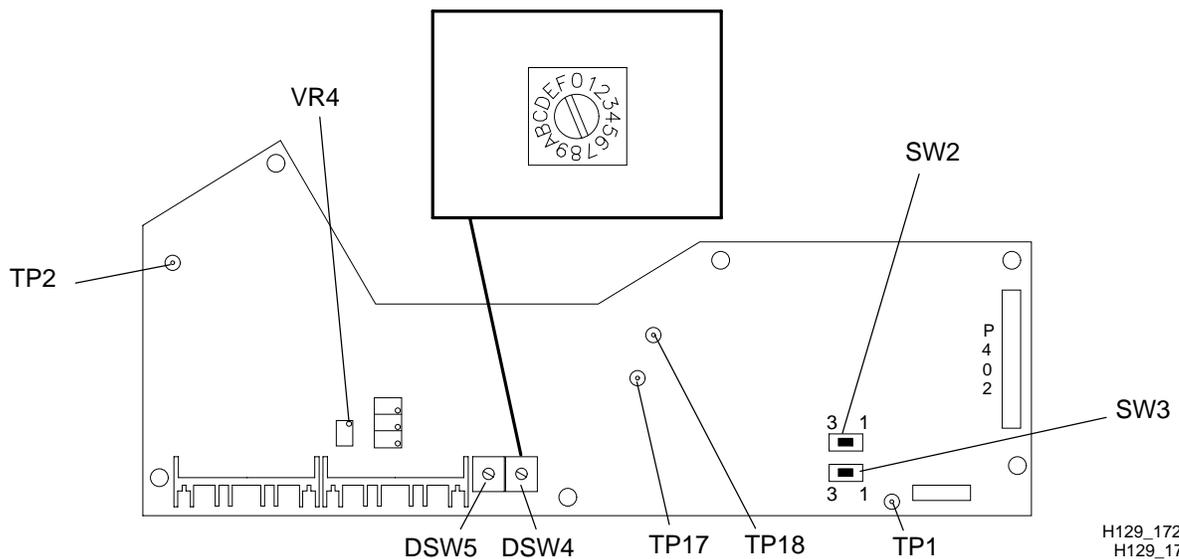
STYLE -02/-03	STYLE -07
SW1: 3	SW2: 3
SW2: 3	SW3: 3
DSW1: 0	
DSW2: 0	
DSW3: 0	

**Style-02/-03 LASER DIODE CONTROL BOARD**



H129\_1722BCA  
H129\_1722BC

**Style-07 LASER DIODE CONTROL BOARD**



H129\_1728BCB  
H129\_1728BC

- [10] Connect the GROUND CLIP of the OSCILLOSCOPE PROBE in Channel A to TP1 on the LDC BOARD.
- [11] Connect the 10X OSCILLOSCOPE PROBE in Channel A to TP18 on the LDC BOARD.
- [12] Connect the GROUND CLIP of the OSCILLOSCOPE PROBE in Channel B to TP1 on the LDC BOARD.
- [13] Connect the 10X OSCILLOSCOPE PROBE in Channel B to TP17 on the LDC BOARD.
- [14] Energize the LASER PRINTER.

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit

Enter Menu Item:
    
```

- [15] Use the PORTABLE COMPUTER to display the CES Main Menu.

```

MONITOR MODE MENU

1 Motors          6 Seq Board Diag
2 Solenoids       7 Enter Commands
3 Relay           8 Set Beam-Splitter
4 Miscellaneous   9 Auto Sensor Test
5 Sensors         10 Semi-Auto Sensor Test

Enter Menu Item:
    
```

```

Input 'HLP' to know commands.

Enter command:
    
```

[16] Enter [1] for “Monitor Mode”.

[17] Enter [7] for “Enter Commands”.

**Note**

- Commands must be entered using capital letters.
- See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.

**Style -02/-03**

```

Enter Command: LDO
    
```

[18] For the STYLE -02/-03 BOARD, enter [L] [D] [O] to energize the laser.

**Style -07**

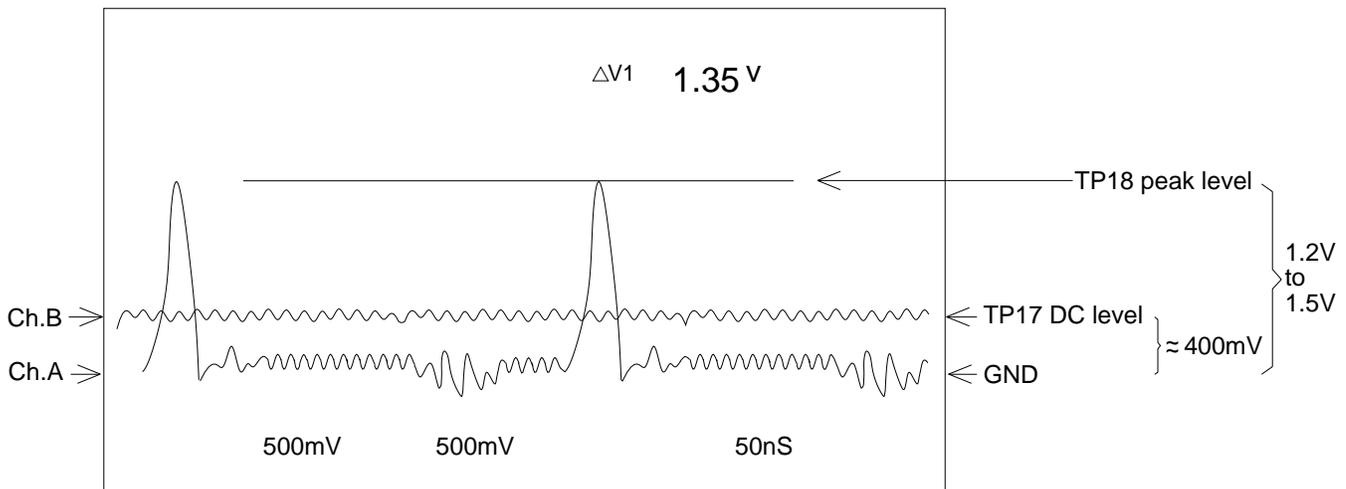
```

Enter Command: OLT
Linear or constant (0/1) [0]:1
Look up table data (0 to 4095) [0]:0
error=0
Enter command:
    
```

For the STYLE -07 BOARD, enter [O] [L] [T], [1], and [0].

[19] Observe the waveforms on the OSCILLOSCOPE.

- The TP17 DC level should be about 400mV. This is the threshold level of the Laser Diode.
- The TP18 peak level should be between 1.2V and 1.5V. TP18 is the output of the Laser Diode. 1.2V to 1.5V is the range to set the Laser Diode for the D-Min exposure levels.



H129\_2700BC

**To Adjust:**

- [20] Rotate POTENTIOMETER VR4 on LASER DIODE CONTROL BOARD until the TP17 DC level is within specification.
- [21] For the STYLE -02/-03 BOARD, rotate POTENTIOMETER VRZ1, in the center of the PORCH BOARD, until the TP18 peak level is within specification.

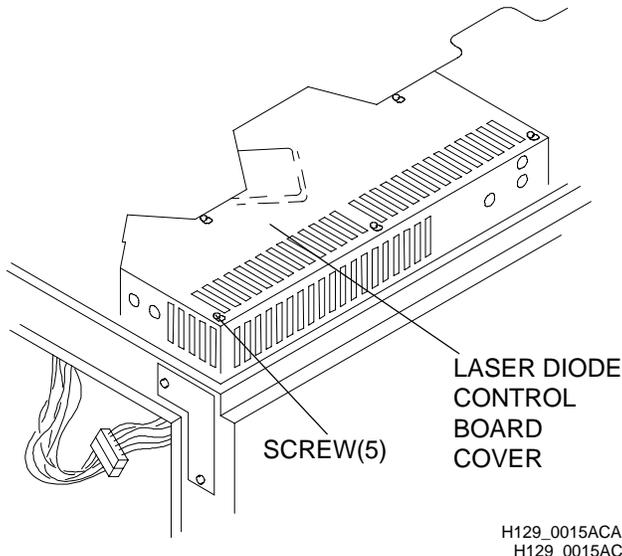
For the STYLE -07 BOARD, adjust the SWITCH DSW4 for a coarse adjustment until the TP18 peak level is within specification. Adjust the SWITCH DSW5 for a fine adjustment

- [22] Type LDF using the PORTABLE COMPUTER.
- [23] Set the LASER DIODE CONTROL BOARD SWITCHES to the following:

STYLE -02/-03	STYLE -07
SW1: 1	SW2: 1
SW2: 1	SW3: 1
DSW1: F	
DSW2: F	
DSW3: F	

- [24] Press [ESC] as many times as needed to exit Diagnostics.
- [25] Remove the OSCILLOSCOPE PROBES.
- [26] Replace the LASER DIODE CONTROL BOARD COVER.
- [27] Replace the TOP COVER.

## Fluctuation of the Laser Diode Reference Current



Use this procedure when noise is present in flat field images and/or images appear grainy shadowing patterns at density transitions.

There are 3 styles of the LASER DIODE CONTROL BOARD. The BOARD contains a silk-screened Canon Part No. with the last two digits:

1. -02
2. -03
3. -07

**Note**

Versions -02 and -03 are identical in the adjustment and will be referenced as -02/-03 BOARD. Version -07 is referenced as -07 BOARD.

[1] De-energize the LASER PRINTER.

[2] Remove the TOP COVER.

[3] Loosen the 5 SCREWS and remove the LASER DIODE CONTROL BOARD COVER.

[4] Connect 1 PROBE TL-2074 to the Channel A input of the OSCILLOSCOPE TL-3348.

[5] Connect the other PROBE TL-2074 to Channel B input of the OSCILLOSCOPE TL-3348.

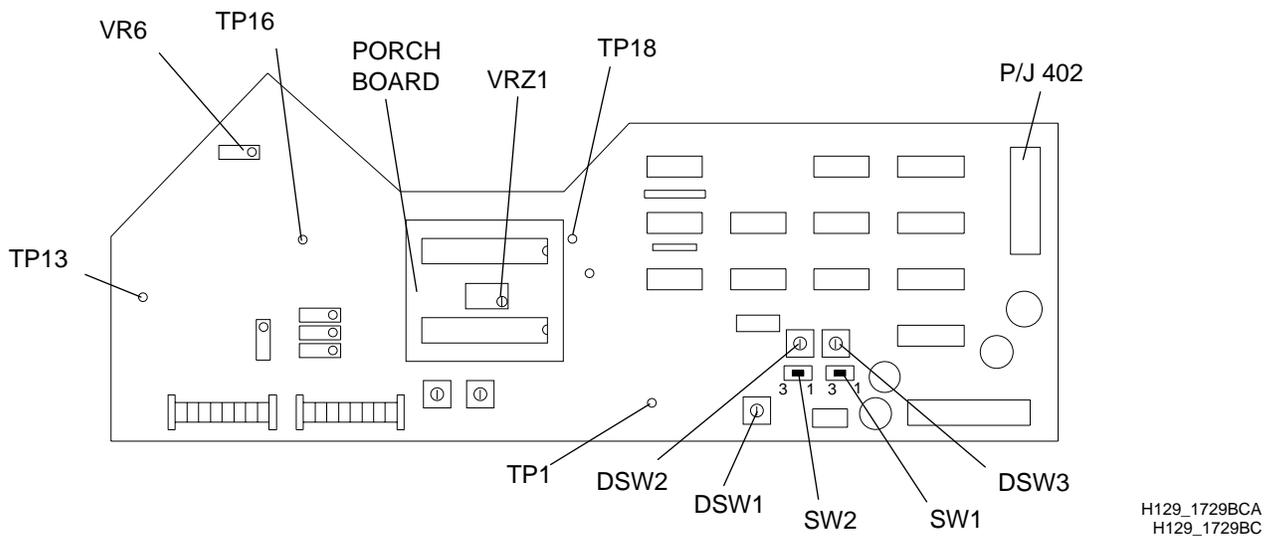
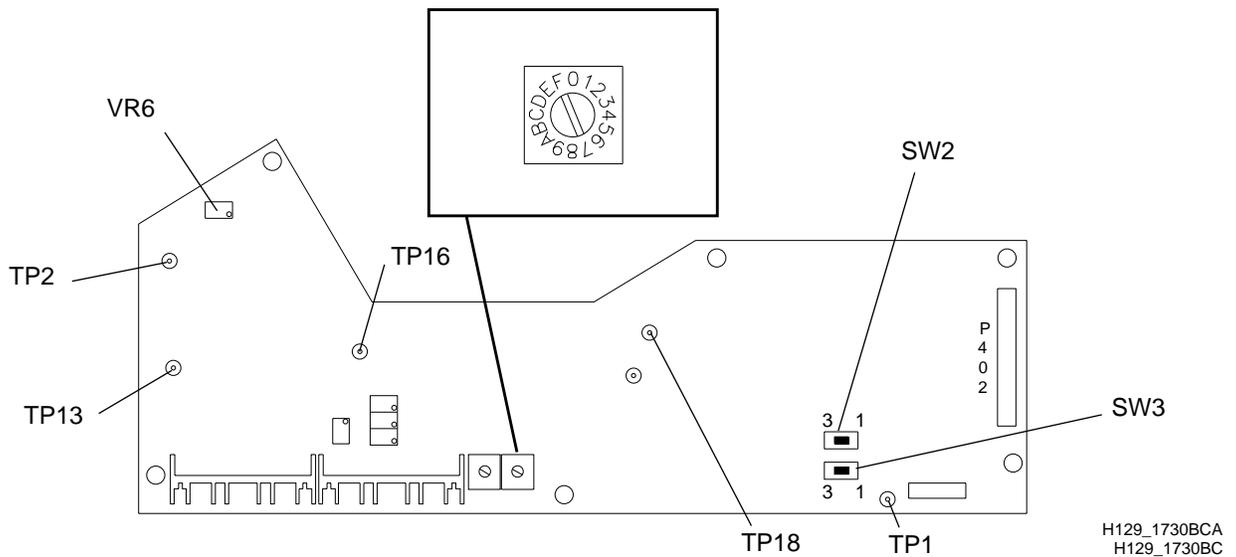
[6] Set the time base to 50 nsec or .05  $\mu$ sec.

[7] Set the voltage levels for each channel to 50 m V/div.

[8] Set the trigger to Channel A, +slope.

[9] Set the LASER DIODE CONTROL BOARD SWITCHES to the following:

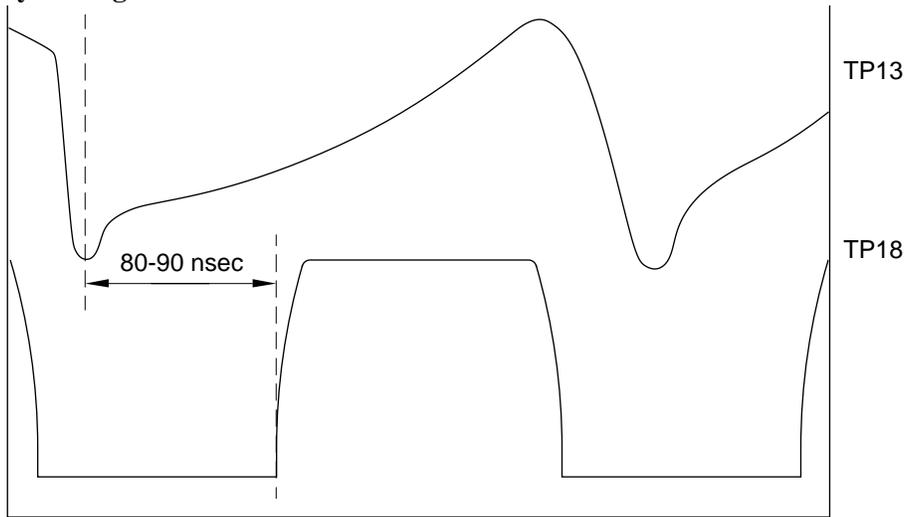
-02/-03	-07
SW1: 3	SW2: 3
SW2: 3	SW3: 3
SW3: 3	
DSW1: F	
DSW2: F	
DSW3: F	



- [10] Connect the ground CLIP of the Channel A PROBE to TP2 (Analog Ground).
- [11] Connect the Channel A PROBE to TP13. TP13 monitors the reference current required to drive the LASER DIODE.
- [12] Connect the ground CLIP of the Channel B PROBE to TP16 (Analog Ground).
- [13] Connect the Channel B PROBE to TP18. TP18 is a clipped representation for LASER DIODE power output.
- [14] Energize the LASER PRINTER.
- [15] Use the portable computer to display the CES MAIN MENU.
- [16] Enter [1] for the “Monitor Mode”.
- [17] Enter [7] for the “Enter Commands”.
- [18] For the -02/-03 BOARD, enter [L][D][O] to energize the LASER DIODE.
- [19] For the -07 BOARD, enter [O][L][T]. When prompted, enter [1] for “Constant”. When prompted, enter 4095 for “Look Up Table Data”. This value turns the LASER DIODE on to 100% power.

- [20] Refer to Figure 1, Time Delay Setting to the Turn Laser Diode On. Verify the end of the falling edge for TP13 (LASER DIODE Reference Current) and the start of the rising edge of TP18 (LASER DIODE Output Power) is 80-90 nsec.

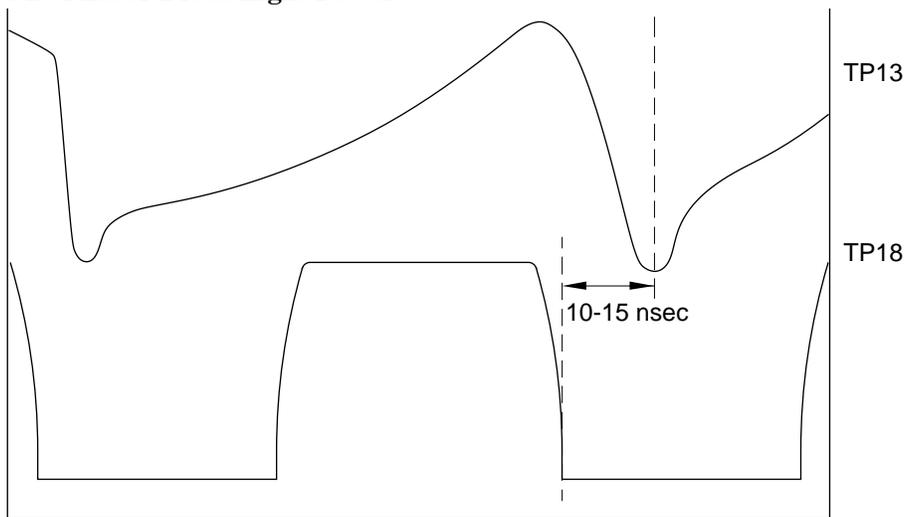
Figure 5-1 Time Delay Setting to Turn On Laser Diode



H129\_91

- [21] If necessary, adjust VR6 of the LDC BOARD.
- [22] If the ringing continues on TP13, adjust VR6 to reduce ringing. Adjust VR7 to achieve the required Time Delay setting of 80-90 nsec.
- [23] Refer to Figure 2, Pulse Width of the LASER DIODE light power. Verify the end of the falling edge for TP18 (LASER DIODE Output Power) and the end of the falling edge of TP13 (LASER DIODE Reference Current) is 10-15 nsec.

Figure 5-2 Pulse Width of Laser Diode Light Power



H129\_91

[24] If necessary, adjust VR3 of the LDC BOARD.

[25] Make sure the portable computer is in the “Enter Commands” mode. Enter [L][D][F] to de-energize the LASER DIODE.

[26] Set the LASER DIODE CONTROL BOARD SWITCHES to the following:

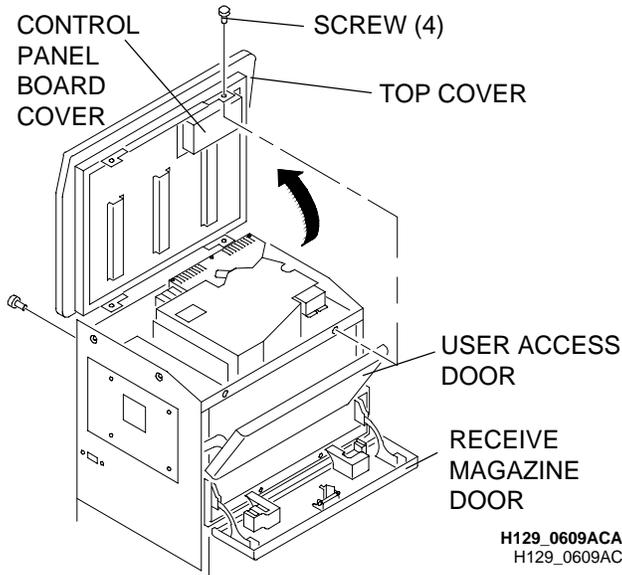
<b>-02/-03</b>	<b>-07</b>
SW1: 1	SW2: 1
SW2: 1	SW3: 1
SW3: 1	
DSW1: F	
DSW2: F	
DSW3: F	

 **Note**

Set the SWITCHES DSW 1, 2, and 3 by aligning the arrow on the BOARD with the long indentation along the side of the SWITCH. The F,F,F setting energizes the LASER DIODE to its maximum power output.

[27] The film densities will change. Do the calibration procedure.

## Control Panel Board



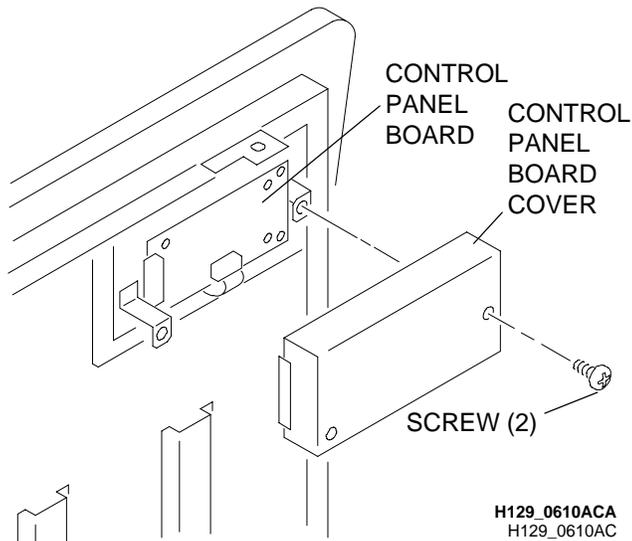
Use this procedure to adjust the contrast of the Control Panel display.

- [1] Energize the LASER PRINTER.
- [2] Press the MAGAZINE DOOR OPEN/CLOSE SWITCH.
- [3] Open the RECEIVE MAGAZINE DOOR.
- [4] Open the USER ACCESS DOOR.
- [5] De-energize the LASER PRINTER.
- [6] Remove the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2-3.
- [7] Remove the 4 SCREWS from the TOP COVER.

### Note

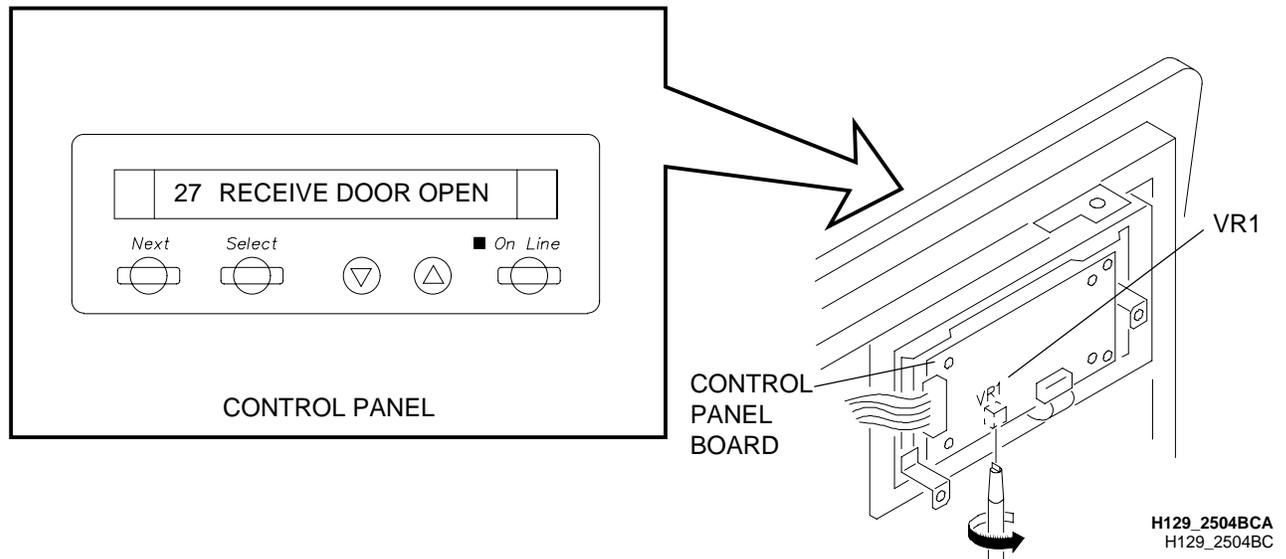
Do not disconnect connectors.

- [8] Lift the front of the TOP COVER and hold it upright so that the CONTROL PANEL BOARD is accessible.



- [9] Remove the CONTROL PANEL BOARD COVER and 2 SCREWS.
- [10] Energize the LASER PRINTER.
- [11] Check that the lighting conditions of the customer site are the same as under normal operating conditions.

- [12] Rotate VR1 until the desired contrast is displayed on the CONTROL PANEL.
- [13] Install the CONTROL PANEL BOARD COVER and 2 SCREWS.
- [14] Install the TOP COVER and 4 SCREWS.
- [15] Install the BACK IMAGE UNIT COVER.
- [16] Close the USER ACCESS DOOR.
- [17] Close the RECEIVE MAGAZINE DOOR.

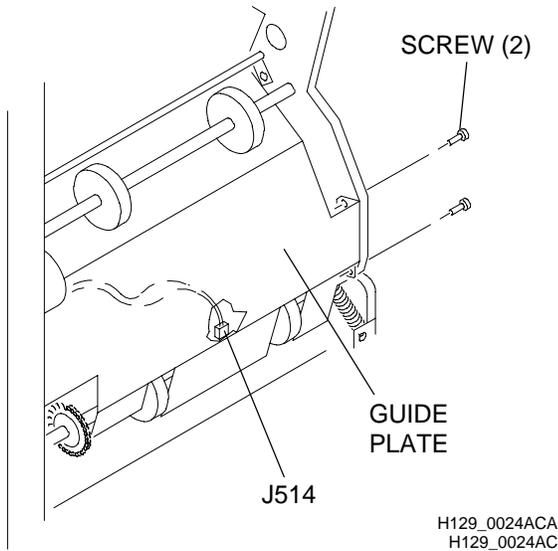


# Sensors

## Sucker Pad Height

**Note**

Do this adjustment after installing the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY.



**To Check:**

- [1] Energize the LASER PRINTER.
- [2] Connect the PORTABLE COMPUTER.

**Warning**

- Dangerous Voltage.
- Possible damage to eyes from invisible laser beam. Wear protective eyewear.
- Do not wear jewelry.

- [3] If present, remove the SUPPLY MAGAZINE.
- [4] Rotate the KEY SWITCH.
- [5] Remove the LEFT IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [6] Loosen the 2 SCREWS to remove the GUIDE PLATE.
- [7] Disconnect J514.
- [8] Use the PORTABLE COMPUTER to display the CES Main Menu.

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit
Enter Menu Item:
    
```

```

MONITOR MODE MENU
1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test
Enter Menu Item:
    
```

- [9] Enter [1] for “Monitor Mode”.

Input 'HLP' to know commands.  
Enter command:

Enter Command: MGO  
error=0

Enter Command: ITR  
error=0

Enter Command: IFD  
error=0  
Enter Command:

Enter Command: VPO  
error=0

error=0  
Enter Command: PMS  
Pulse number? (-30000 to 30000) [0]: -500  
Speed? (10 to 1500 pps) [10]: 300

[10] Enter [7] for "Enter Commands".

 **Note**

- Commands must be entered using capital letters.
- See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.

[11] Enter [M] [G] [O] to open the SUPPLY MAGAZINE WINDOW.

[12] Enter [I] [T] [R] to place the TRANSPORT ROLLERS in the initial position.

[13] Enter [I] [F] [D] to move the SUCKER PADS into the initial position.

[14] Enter [V] [P] [O] to start the ELECTROMAGNETIC PUMP.

 **Note**

The next 3 steps will move the SUPPLY ROLLER out of the way.

[15] Enter [P] [M] [S].

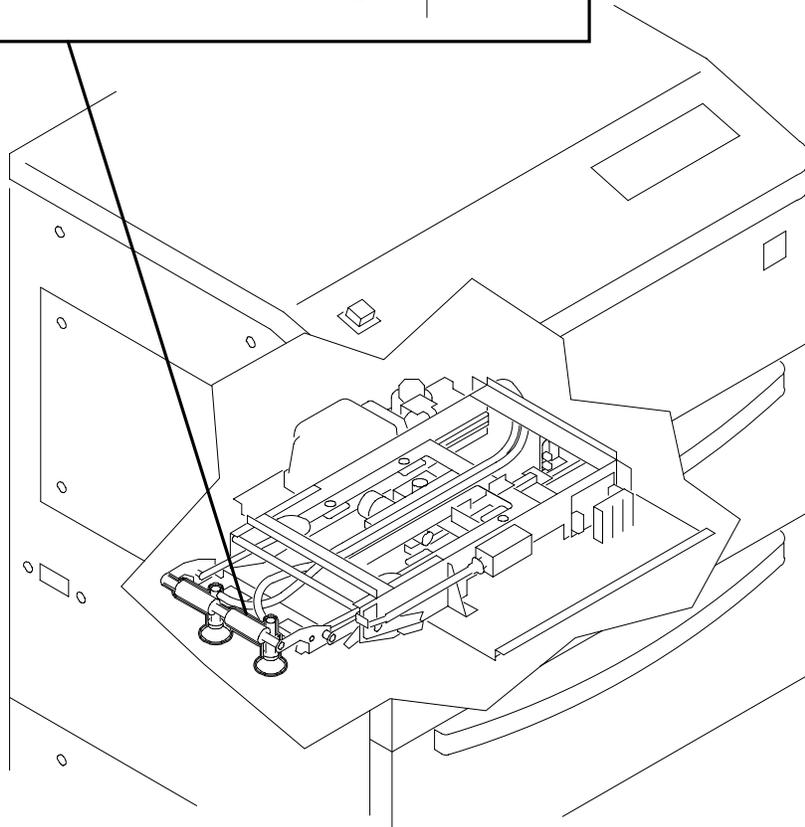
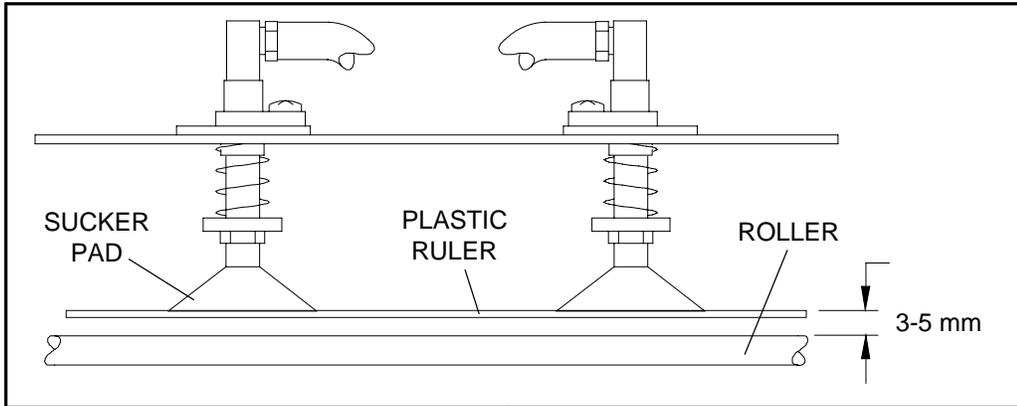
[16] Enter [-] [5] [0] [0] for the pulse number.

[17] Enter [3] [0] [0] for the speed.

[18] Press the PLASTIC RULER against the SUCKER PADS.

[19] Use the RULER to measure the distance between the PLASTIC RULER and the ROLLER. The distance should be 3-5 mm (0.12-0.20 in.).

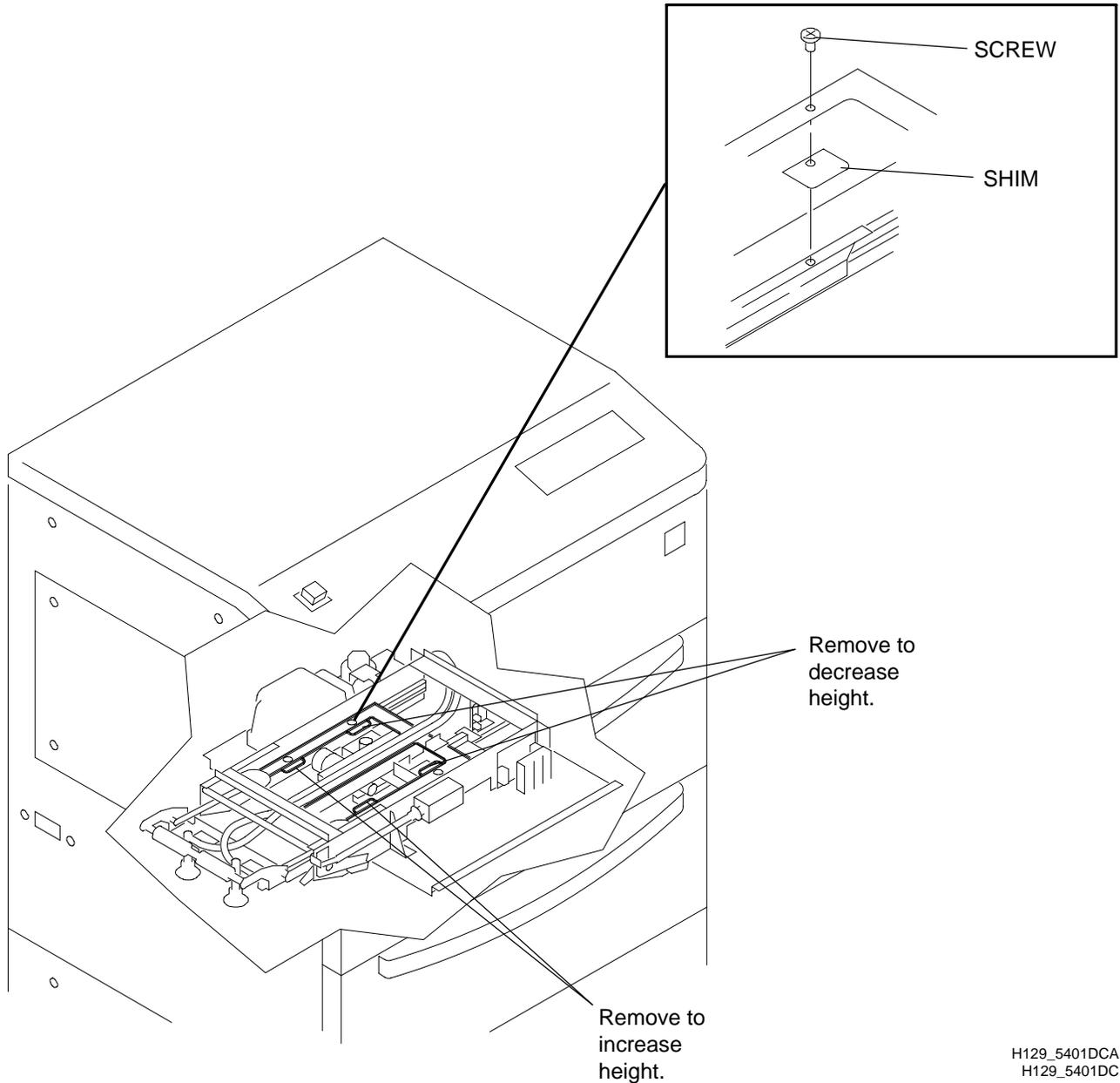
[20] Enter VPF to turn the ELECTROMAGNETIC PUMP off.



H129\_5400DCA  
H129\_5400DC

**To Adjust:**

- [21] De-energize the LASER PRINTER.
- [22] Remove the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY. If necessary, see the procedure on Page 2-42.
- [23] Loosen the SCREW.
- [24] Remove the front SHIMS to increase the distance. Remove the back SHIMS to decrease the distance.
- [25] Install the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY.
- [26] Check that the adjustment is correct.



H129\_5401DCA  
H129\_5401DC

## PHF Film Suction Sensor

### Note

Use the PORTABLE COMPUTER to check if the sensor is malfunctioning before doing this procedure. If necessary, see the Diagnostics Manual DG3226.

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit
Enter Menu Item:

```

```

MONITOR MODE MENU
1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test
Enter Menu Item:

```

```

Input 'HLP' to know commands.
Enter command:

```

```

Enter Command: VPO
error=0

```

```

Enter Command: VPF
error=0

```

### To Check:

[1] Install the PORTABLE COMPUTER. See “Using the Portable Computer” in the Diagnostic Section.

[2] Use the PORTABLE COMPUTER to display the CES Main Menu.

[3] Enter [1] for “Monitor Mode”.

[4] Enter [7] for “Enter Commands”.

### Note

- Commands must be entered using capital letters.
- See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.

[5] Remove the RIGHT IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.

[6] Measure the distance between the FLAG and the edge of the SENSOR. The distance should be 1 mm (.04 in.).

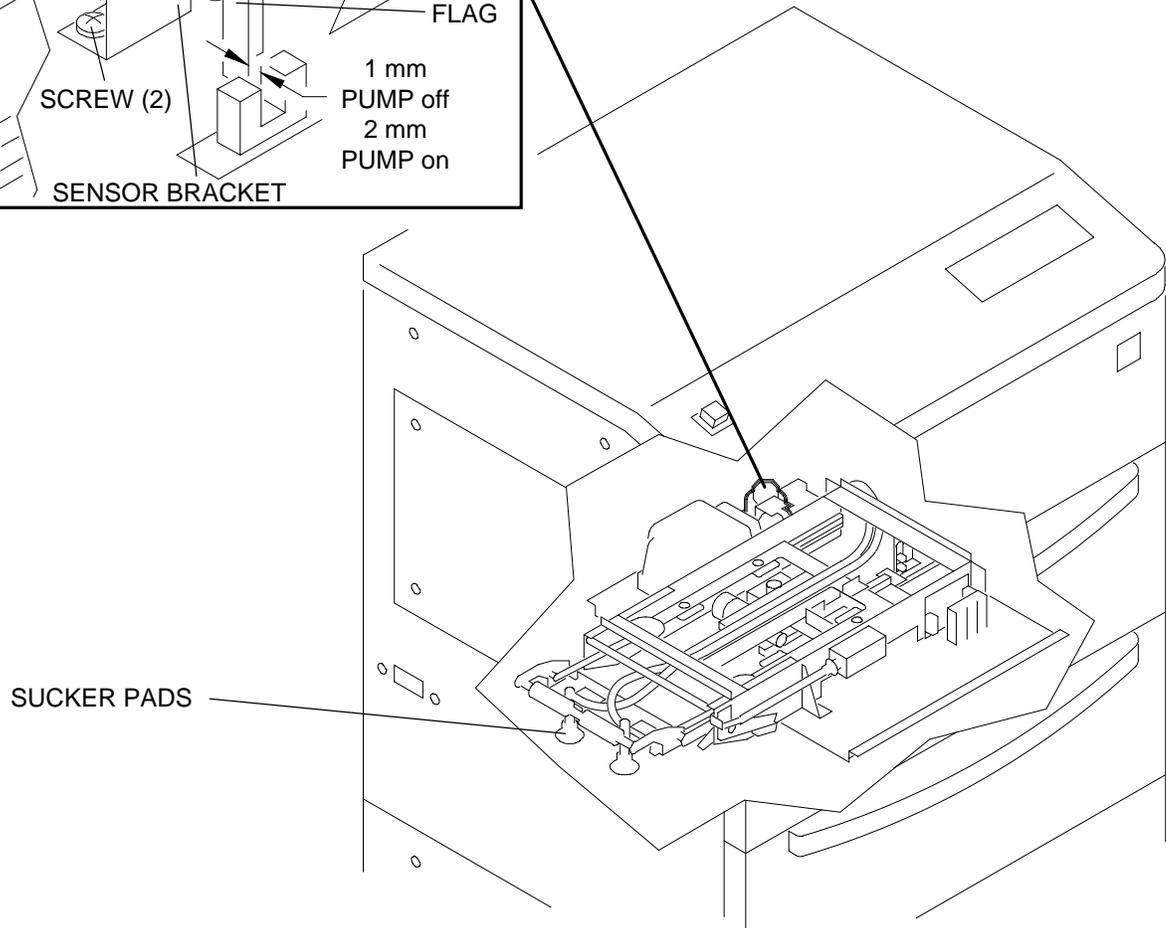
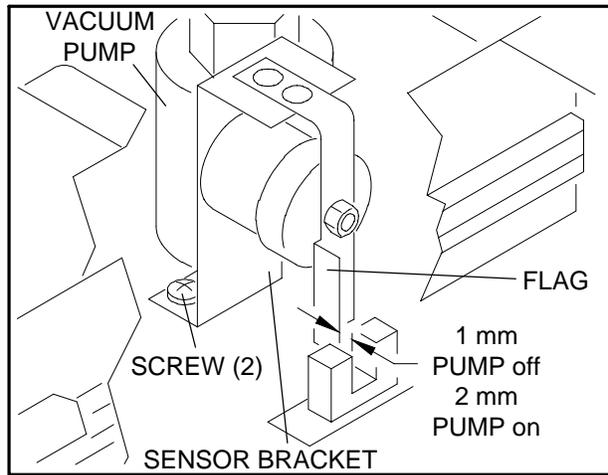
[7] Enter [V] [P] [O] to start the ELECTROMAGNETIC PUMP.

[8] Install a PLASTIC RULER or small piece of film under the SUCKER PADS.

[9] Measure the distance between the FLAG and the edge of the SENSOR. The distance should be 2 mm (.08 in.).

[10] Enter [V] [P] [F] to turn off the ELECTROMAGNETIC PUMP.

[11] If necessary, do the adjustment procedure.



H129\_2600DCA  
H129\_2600DC

**To Adjust:**

[12] Loosen the 2 SCREWS.

[13] Move the SENSOR BRACKET until the measurement is within specification.

[14] Tighten the 2 SCREWS.

## PHS1 S Magazine Open Sensor

MAIN MENU

1 Monitor Mode	4 System Params
2 System Logs	5 Debug Utility
3 Boards Diag	6 Exit

Enter Menu Item:

MONITOR MODE MENU

1 Motors	6 Seq Board Diag
2 Solenoids	7 Enter Commands
3 Relay	8 Set Beam-Splitter
4 Miscellaneous	9 Auto Sensor Test
5 Sensors	10 Semi-Auto Sensor Test

Enter Menu Item:

Input 'HLP' to know commands.

Enter command:

Enter Command: SMO  
error=0

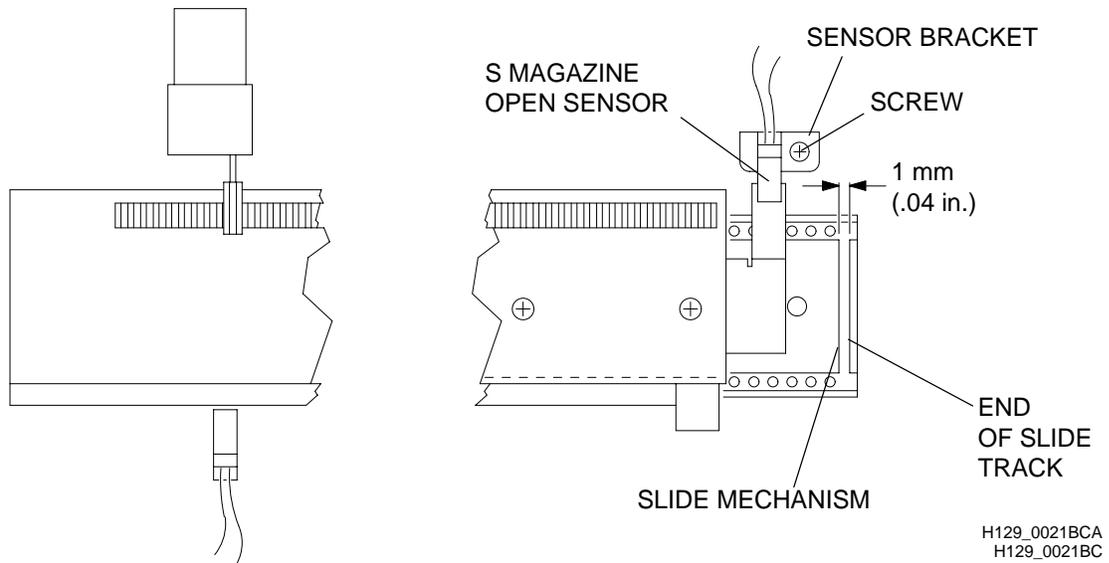
### To Check:

- [1] Install the PORTABLE COMPUTER. See "Using the Portable Computer" in the Diagnostic Section.
- [2] Use the PORTABLE COMPUTER to display the CES Main Menu.
- [3] Enter [1] for "Monitor Mode".

- [4] Enter [7] for "Enter Commands".

### Note

- Commands must be entered using capital letters.
  - See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.
- [5] Open the RIGHT IMAGE UNIT COVER. If necessary, see the procedure on Page 2-3.
  - [6] Enter [S] [M] [O] to open the SUPPLY MAGAZINE WINDOW.

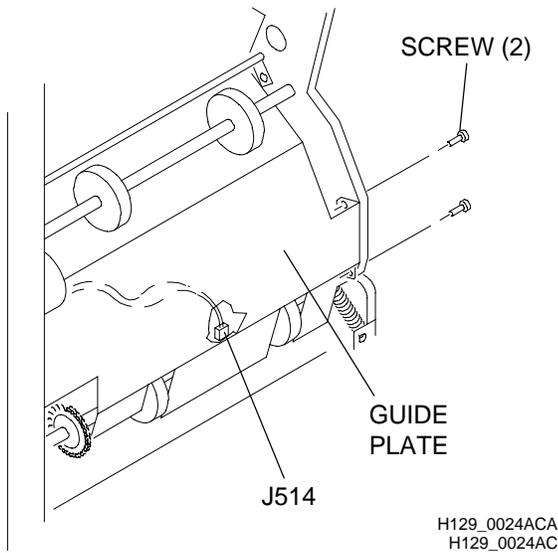


- [7] Check that the distance between the END OF THE SLIDE TRACK and the SLIDE MECHANISM is 1 mm (0.04 in.).

**To Adjust:**

- [8] Loosen the SCREW.
- [9] Move the SENSOR BRACKET until the distance is correct.
- [10] Enter [S] [M] [C] to close the SUPPLY MAGAZINE WINDOW.
- [11] Enter [S] [M] [O] to open the SUPPLY MAGAZINE WINDOW.
- [12] Check that the distance between the END OF THE SLIDE TRACK and the SLIDE MECHANISM is 1 mm (0.04 in.)
- [13] Tighten the SCREW.
- [14] Check that the adjustment is correct.

**PHS2 S Magazine Close Sensor**



**To Check:**

- [1] Install the PORTABLE COMPUTER. See “Using the Portable Computer” in the Diagnostic Section.

**Warning**

- Dangerous Voltage.
- Possible damage to eyes from invisible laser beam. Wear protective eyewear.
- Do not wear jewelry.

- [2] Open the LEFT IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.

- [3] Loosen the 2 SCREWS to remove the GUIDE PLATE.

- [4] Disconnect J514.

- [5] Use the PORTABLE COMPUTER to display the CES Main Menu.

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit

Enter Menu Item:
    
```

- [6] Enter [1] for “Monitor Mode”.

```

MONITOR MODE MENU
1 Motors           6 Seq Board Diag
2 Solenoids       7 Enter Commands
3 Relay           8 Set Beam-Splitter
4 Miscellaneous   9 Auto Sensor Test
5 Sensors         10 Semi-Auto Sensor Test

Enter Menu Item:
    
```

- [7] Enter [7] for “Enter Commands”.

```

Input 'HLP' to know commands.

Enter command:
    
```

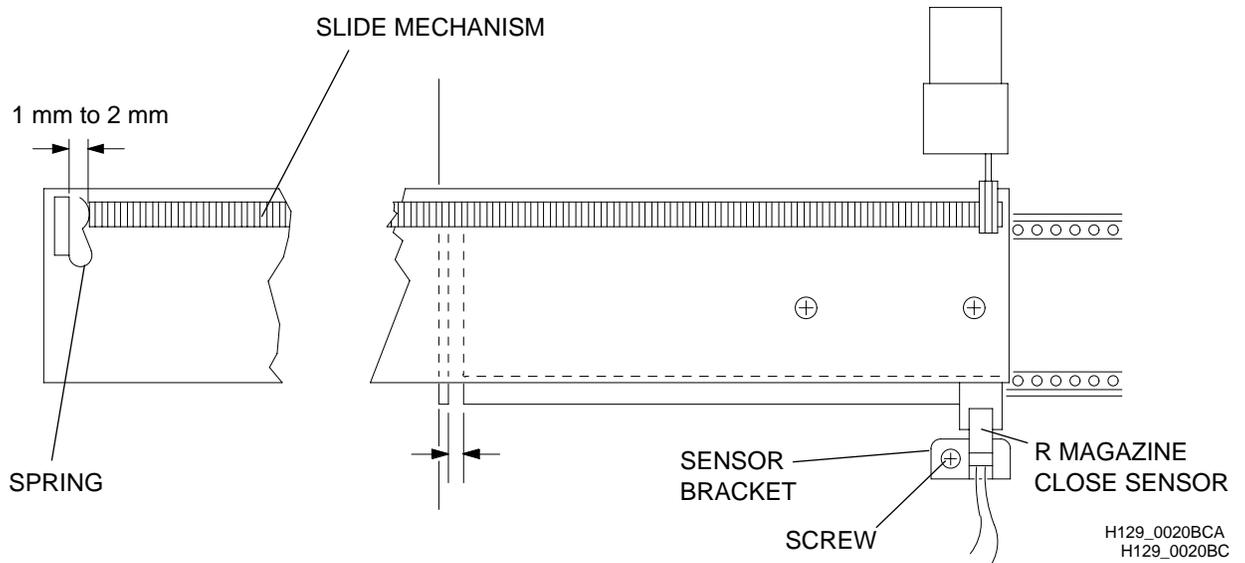
**Note**

- Commands must be entered using capital letters.
- See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.

- [8] Enter [S] [M] [C] to close the SUPPLY MAGAZINE WINDOW.

- [9] Remove the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY with TRANSPORTATION UNIT. If necessary, see the procedure on Page 2–42.

- [10] Check that the distance between the SPRING and the SLIDE MECHANISM is 1-2 mm (0.04-0.08 in) with the SLIDE MECHANISM fully extended against the SPRING.



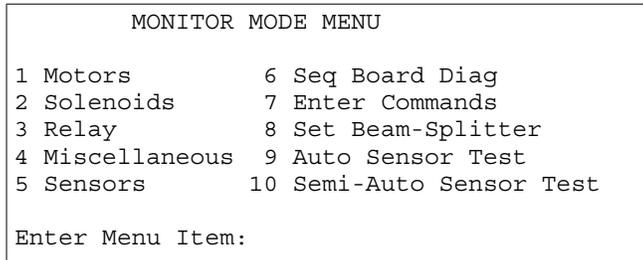
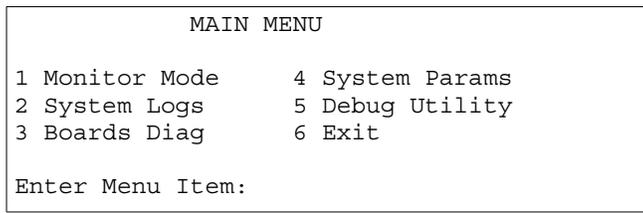
**To Adjust:**

- [11] Loosen the SCREW.  
 [12] Move the SENSOR BRACKET until the distance is correct.  
 [13] Tighten the SCREW.  
 [14] Check that the adjustment is correct.

## PH3 S Magazine Door Sensor

### Note

This procedure cannot be done on machines after S/N 500249. DETECTORS were changed from PHOTO DETECTORS to MICROSWITCHES to comply with European standards.



### To Check:

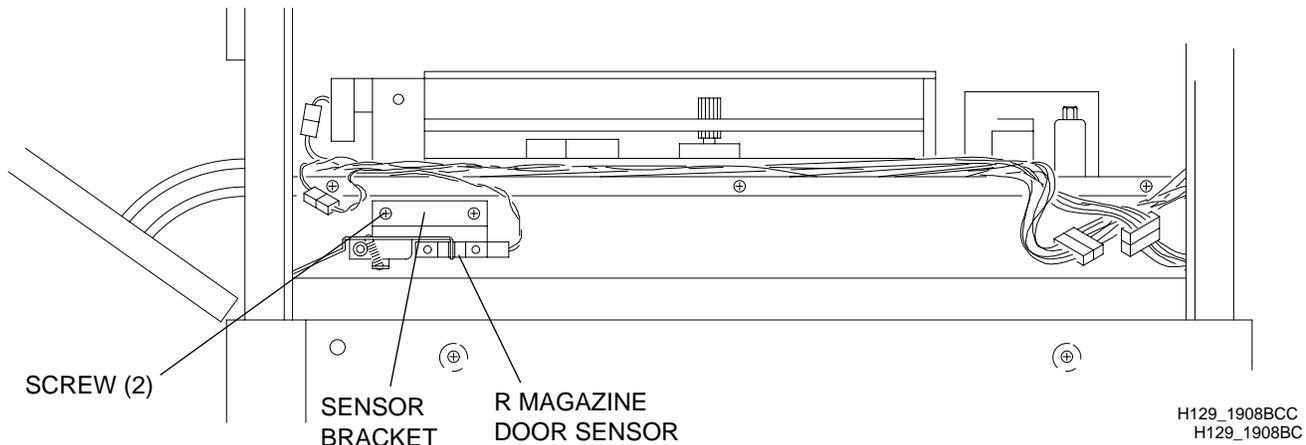
- [1] Install the PORTABLE COMPUTER. See "Using the Portable Computer" in the Diagnostic Section.
- [2] Use the PORTABLE COMPUTER to display the CES Main Menu.
- [3] Enter [1] for "Monitor Mode".
- [4] Enter [5] for "Sensors".

[5] Remove the RIGHT IMAGE UNIT COVER. If necessary, see the procedure on Page 2-3.

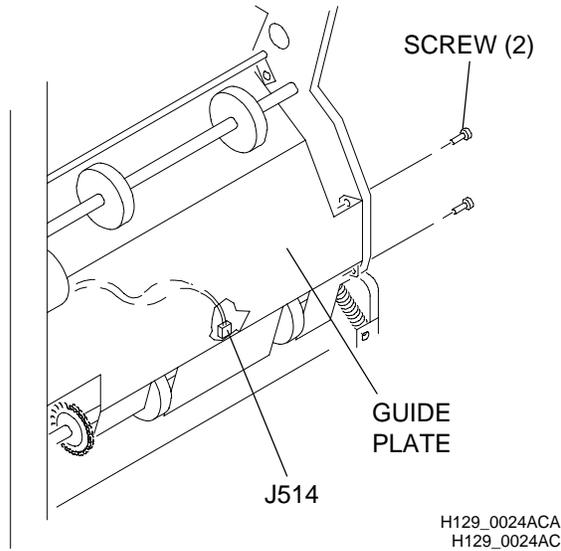
[6] On the PORTABLE COMPUTER, check that the S MAGAZINE DOOR SENSOR PH3 reads 0 when the DOOR is closed, and 1 when the DOOR is open.

### To Adjust:

- [7] Loosen the 2 SCREWS.
- [8] Move the SENSOR BRACKET until the SENSOR reads 0 when the DOOR is closed and 1 when the DOOR is open.
- [9] Tighten the 2 SCREWS.



## CHS1 Slide Base Position Sensor Reference Position



### To Check:

- [1] Set up the PORTABLE COMPUTER.
- [2] Open the USER ACCESS DOOR.



### Warning

- Dangerous Voltage.
- Possible damage to eyes from invisible laser beam. Wear protective eyewear.
- Do not wear jewelry.

- [3] Rotate the KEYSWITCH to the ON position.
- [4] Remove the LEFT IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [5] Remove the 2 SCREWS to remove the GUIDE PLATE.
- [6] Disconnect J514.
- [7] Use the PORTABLE COMPUTER to display the CES Main Menu.

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit
Enter Menu Item:
    
```

```

MONITOR MODE MENU
1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test
Enter Menu Item:
    
```

```

Input 'HLP' to know commands.
Enter command:
    
```

```

Enter Command: MGO
error=0
    
```

- [8] Enter [1] for “Monitor Mode”.

- [9] Enter [7] for “Enter Commands”.

### Note

- Commands must be entered using capital letters.
- See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.

- [10] Enter [M] [G] [O] to open the SUPPLY MAGAZINE WINDOW.

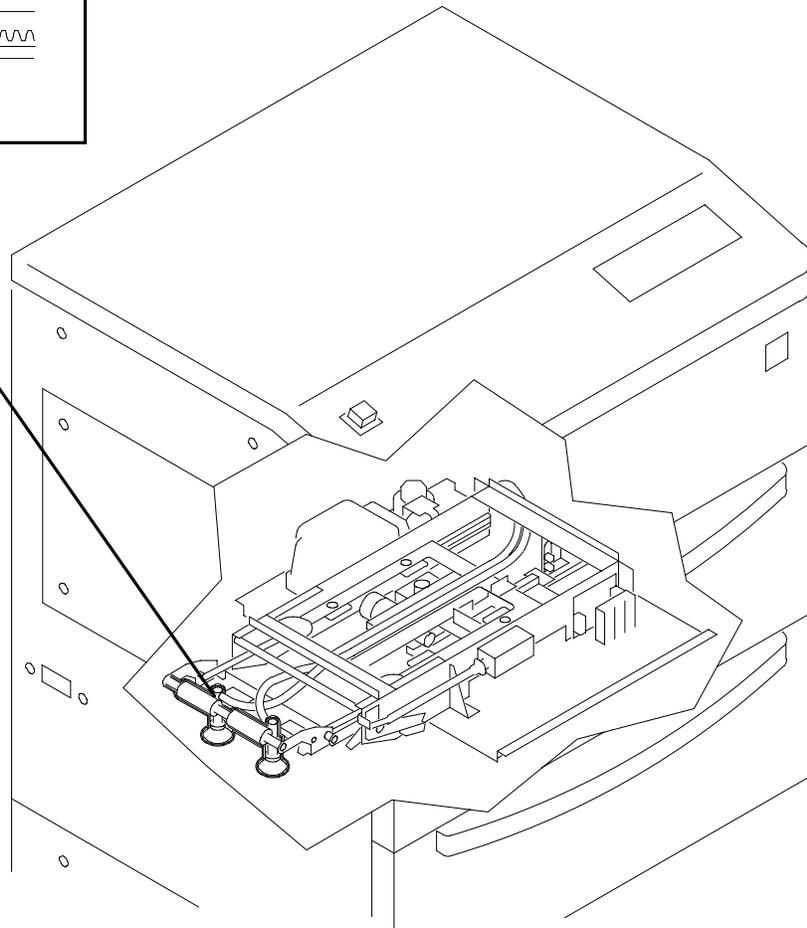
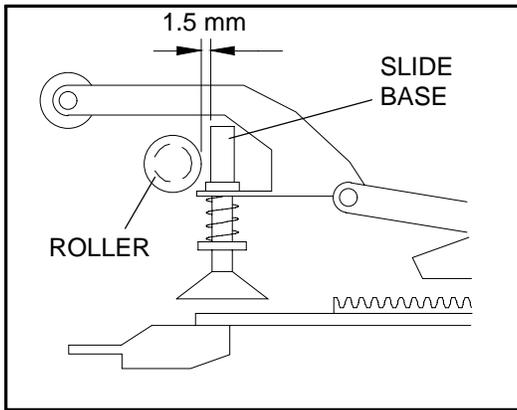
Enter Command: ITR  
error=0

Enter Command: IFD  
Check the S-Mag open.  
Are you ready?,Y/N (0/1) [0]:  
error=0  
Enter Command:

[11] Enter [I] [T] [R] to place the TRANSPORT ROLLERS in the initial position.

[12] Enter [I] [F] [D] to move the SUCKER PADS into the initial position.

[13] Check that the distance between the SLIDE BASE and the ROLLER is 1.5 mm (0.06 in.).



H129\_5404DCA  
H129\_5404DC

**To Adjust:**

```
error=0
Enter Command: PMF

Pulse number? (-30000 to 30000) [0]: + or
- 2 or 3
Speed? (10 to 1500 pps) [10]: 10
```

[14] Enter [P] [M] [F].

**Note**

In the next step, enter a + pulse to move the SLIDE BASE toward the ROLLER. Enter a - pulse to move the SLIDE BASE from the ROLLER.

[15] Move the SLIDE BASE until the distance is correct:

- (a) Enter [+] or [-] [2] or [3] for the pulse number.
- (b) Enter [1] [0] for the speed.
- (c) Repeat until the distance between the SLIDE BASE and the ROLLER is 1.5 mm (0.06 in.)

```
error=0
Enter Command: PMF

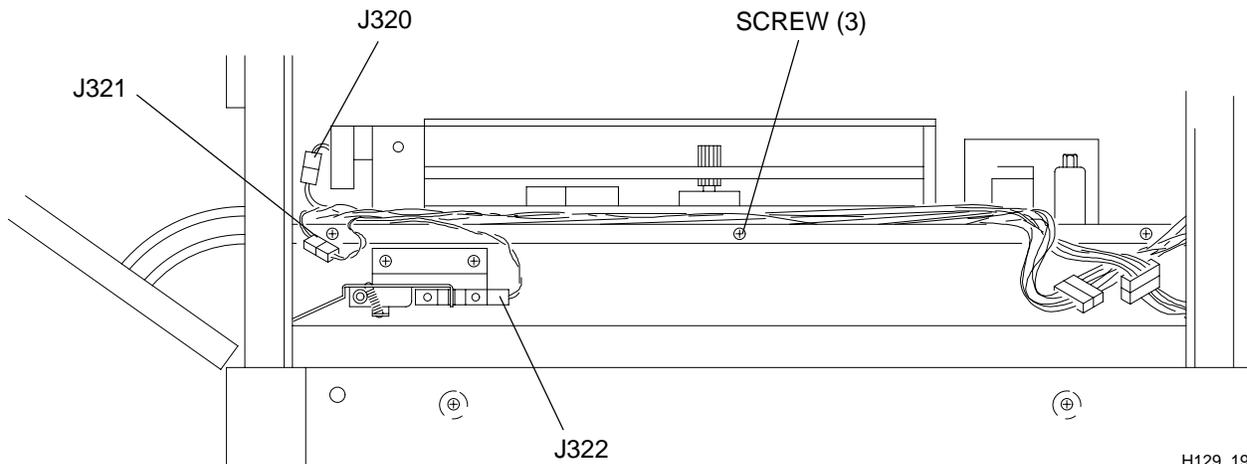
Pulse number? (-30000 to 30000) [0]: -794
Speed? (10 to 1500 pps) [10]: 300
```

[16] Enter [P] [M] [F] to retract the SLIDE BASE.

[17] Enter [-] [7] [9] [4]

[18] Enter [3] [0] [0] for the speed.

[19] Remove the RIGHT IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.



H129\_1908BCD  
H129\_1908BC

[20] Disconnect the following connectors:

J320

J321

J322.



**Caution**

The SUCKER PADS must be in the up position.

[21] Remove the 3 SCREWS.

[22] Move the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY forward 25 - 51 mm (1 - 2 in.) to allow access to the SLIDE BASE POSITION SENSOR FLAG.

```
Enter Command: PHT
error=0
```

[23] Enter [P] [H] [T] to observe sensors.

 **Note**

The state of CHS-1 displayed on the PORTABLE COMPUTER should change between 0 and 1 during the next step.

 **Important**

Do not loosen FLAG SCREWS for the next step.

[24] Observe the state of CHS-1 displayed on the PORTABLE COMPUTER while trying to move the sensor flag without loosening the mounting screws.

 **Important**

If the state of CHS-1 changes from 0 to 1, the adjustment is complete. Go to Step 33. If the state of CHS-1 does not change, do the following step.

```
error=0
Enter Command: PMF

Pulse number? (-30000 to 30000) [0]: -10
Speed? (10 to 1500 pps) [10]: 10
```

[25] Enter [P] [M] [F].

[26] Enter [-] [1] [0] for the pulse number.

[27] Enter [1] [0] for the speed.

```
Enter Command: PHT
error=0
```

[28] Enter [P] [H] [T] to observe sensors.

[29] Observe the state of CHS-1 displayed on the PORTABLE COMPUTER while trying to move the sensor flag without loosening the mounting screws.



### Important

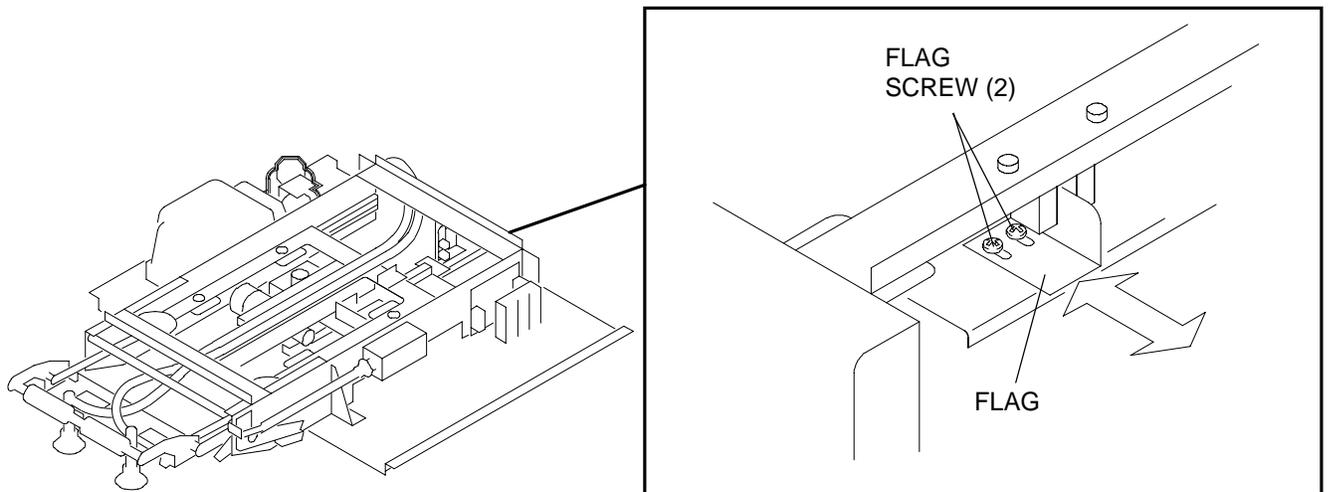
If the state of CHS-1 changes from 0 to 1, the adjustment is complete. Go to Step 33. If the state of CHS-1 does not change, do the following step.

[30] Loosen the 2 SCREWS.

[31] Adjust the position of the FLAG at the position where CHS-1 just changes from 0 to 1.

[32] Tighten the 2 SCREWS.

[33] Replace the SUPPLY MAGAZINE OPEN/CLOSE ASSEMBLY and recheck using Steps 7 and 13.



H129\_5406BCA  
H129\_5406BC

## PHR1 R Magazine Open Sensor

### To Check:

- [1] Install the PORTABLE COMPUTER. See “Using the Portable Computer” in the Diagnostic Section.
- [2] Open the RIGHT IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit
Enter Menu Item:
    
```

- [3] Use the PORTABLE COMPUTER to display the CES Main Menu.

```

MONITOR MODE MENU
1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test
Enter Menu Item:
    
```

- [4] Enter [1] for “Monitor Mode”.

```

Input 'HLP' to know commands.
Enter command:
    
```

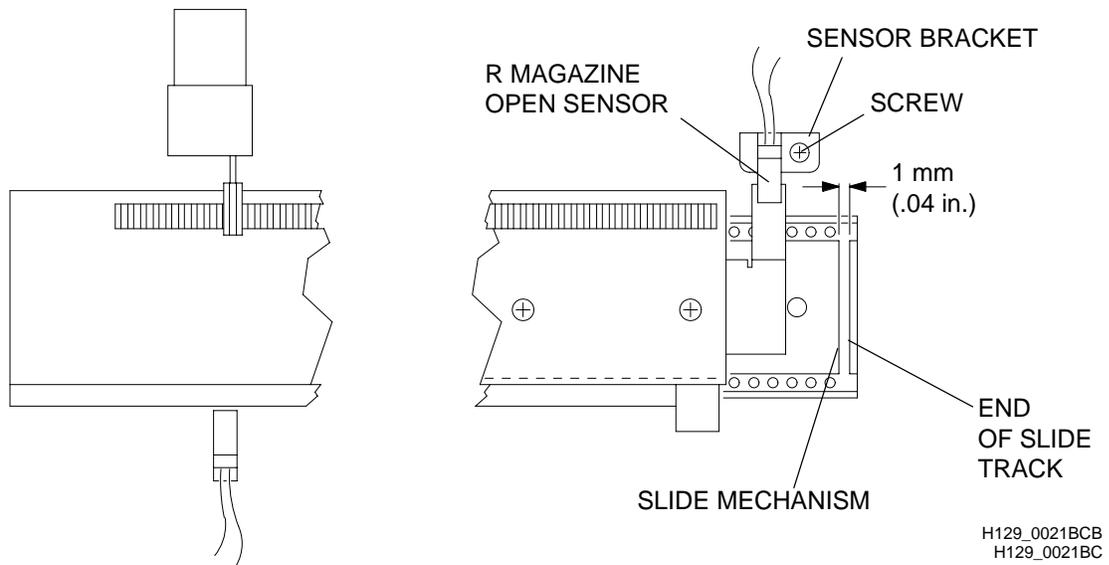
- [5] Enter [7] for “Enter Commands”.

```

Enter Command: RMO
error=0
    
```

### Note

- Commands must be entered using capital letters.
  - See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.
- [6] Enter [R] [M] [O] to open the RECEIVE MAGAZINE WINDOW.

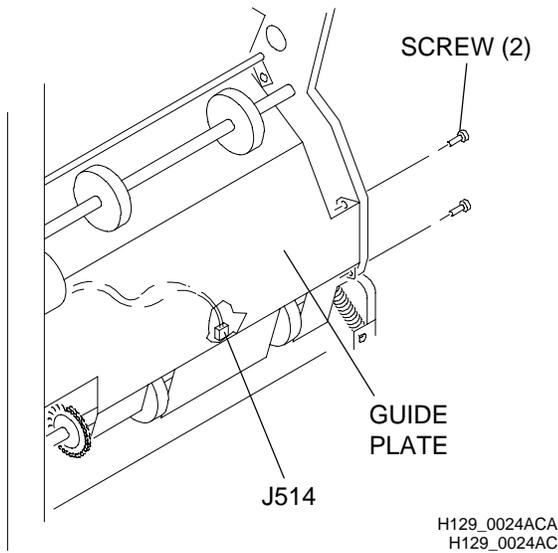


[7] Check that the distance between the END OF THE SLIDE TRACK and the SLIDE MECHANISM is 1 mm (0.04 in.).

**To Adjust:**

- [8] Loosen the SCREW.
- [9] Move the SENSOR BRACKET until the distance is correct.
- [10] Tighten the SCREW.
- [11] Check that the adjustment is correct.

**PHR2 R Magazine Close Sensor**



**To Check:**

- [1] Install the PORTABLE COMPUTER. See “Using the Portable Computer” in the Diagnostic Section.

**Warning**

- Dangerous Voltage.
- Possible damage to eyes from invisible laser beam. Wear protective eyewear.
- Do not wear jewelry.

- [2] Open the LEFT IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.

- [3] Remove the 2 SCREWS to remove the GUIDE PLATE.

- [4] Disconnect J514.

- [5] Place SUCKERS in the up position.

- [6] Use the PORTABLE COMPUTER to display the CES Main Menu.

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit
Enter Menu Item:
    
```

```

MONITOR MODE MENU
1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test
Enter Menu Item:
    
```

```

Input 'HLP' to know commands.
Enter command:
    
```

- [7] Enter [1] for “Monitor Mode”.

- [8] Enter [7] for “Enter Commands”.

**Note**

- Commands must be entered using capital letters.
- See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.

```

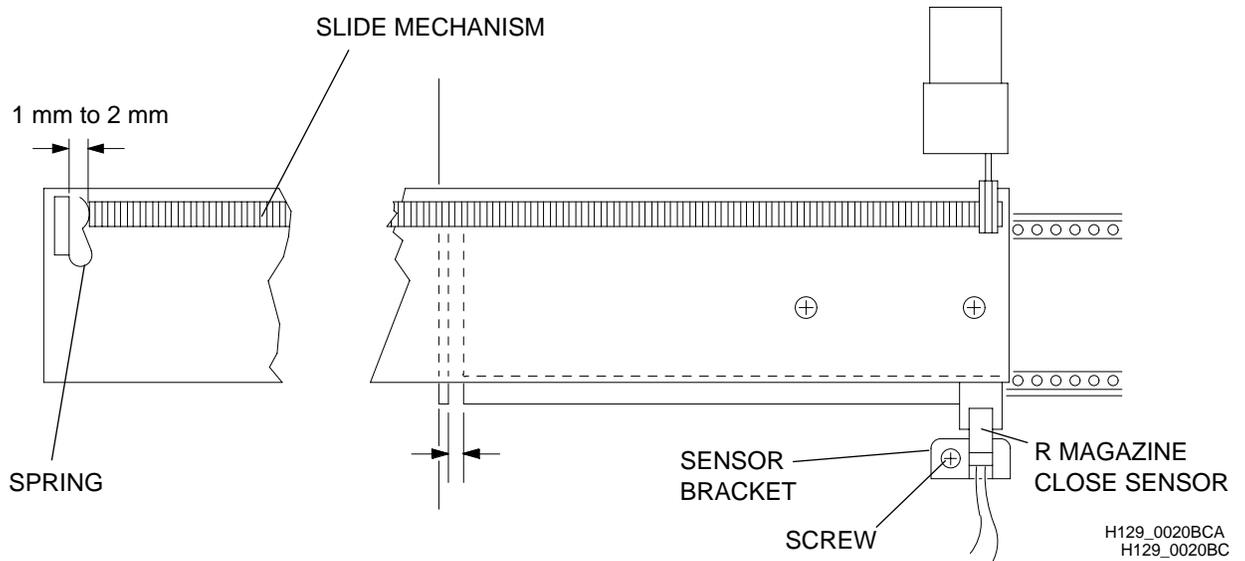
Enter Command: RMC

Check the Sucker's positions:
Are you ready?,Y/N (0/1) [0]: 0

error=0
Enter Command:
    
```

[9] Enter [R] [M] [C] to close the RECEIVE MAGAZINE WINDOW.

- [10] Remove the RECEIVE MAGAZINE OPEN/CLOSE ASSEMBLY. If necessary, see the procedure on Page 2-48.
- [11] Check that the distance between the SPRING and the SLIDE MECHANISM is 1mm (0.04 in.) to 2mm (0.08 in.) deflection with the SLIDE MECHANISM fully extended against the SPRING.



**To Adjust:**

- [12] Loosen the SCREW.
- [13] Move the SENSOR BRACKET until the distance is correct.
- [14] Tighten the SCREW.
- [15] Check that the adjustment is correct.

## PH4 R Magazine Door Sensor

### Note

This procedure cannot be done on machines after S/N 500249. DETECTORS were changed from PHOTODETECTORS to MICROSWITCHES to comply with European standards.

### To Check:

- [1] Install the PORTABLE COMPUTER. See “Using the Portable Computer” in the Diagnostic Section.
- [2] Remove the RIGHT IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.

```

MAIN MENU

1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit

Enter Menu Item:
    
```

- [3] Use the PORTABLE COMPUTER to display the CES Main Menu.

```

MONITOR MODE MENU

1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test

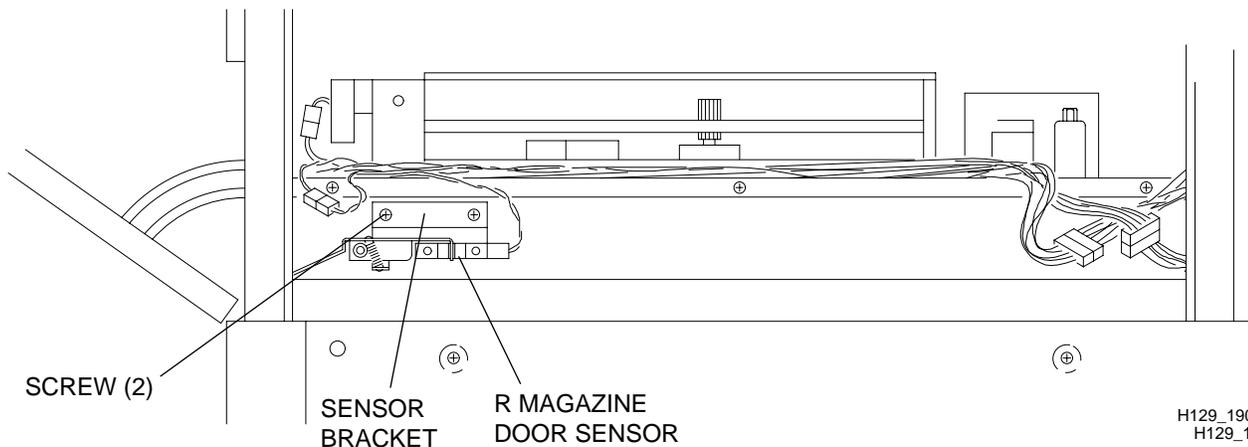
Enter Menu Item:
    
```

- [4] Enter [1] for “Monitor Mode”.
- [5] Enter [5] for “Sensors”.

- [6] On the PORTABLE COMPUTER, check that the R MAGAZINE DOOR SENSOR PH4 reads 0 when the DOOR is closed, and 1 when the DOOR is open.

### To Adjust:

- [7] Loosen the 2 SCREWS.
- [8] Move the SENSOR BRACKET until the SENSOR reads 0 when the DOOR is closed and 1 when the DOOR is open.
- [9] Tighten the 2 SCREWS.



H129\_1908BCC  
H129\_1908BC

## Receive Side Stopper Position

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit
Enter Menu Item:

```

```

MONITOR MODE MENU
1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test
Enter Menu Item:

```

```

Input 'HLP' to know commands.
Enter command:

```

```

Enter Command: ITR
error=0

```

```

error=0
Enter Command: PMR

Pulse number? (-30000 to 30000) [0]: -281
Speed? (10 to 1500 pps) [10]: 444

```

### To Check:

- [1] Connect the PORTABLE COMPUTER.
- [2] Open the RECEIVE MAGAZINE DOOR.
- [3] Open the USER ACCESS DOOR.
- [4] Rotate the KEYSWITCH to the ON position.
- [5] Use the PORTABLE COMPUTER to display the CES Main Menu.

[6] Enter [1] for “Monitor Mode”.

[7] Enter [7] for “Enter Commands”.

### Note

- Commands must be entered using capital letters.
- See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.

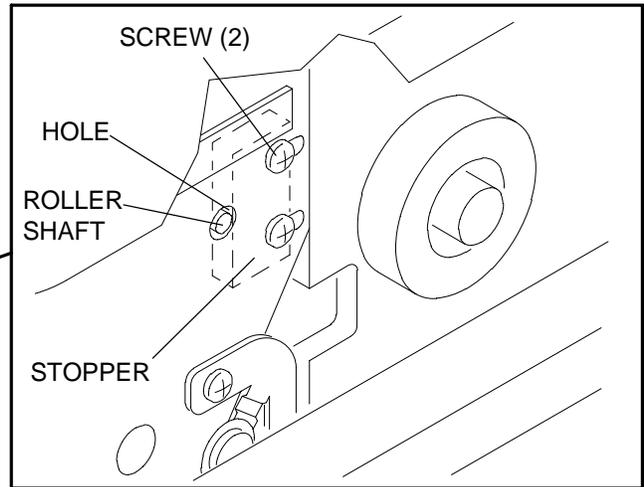
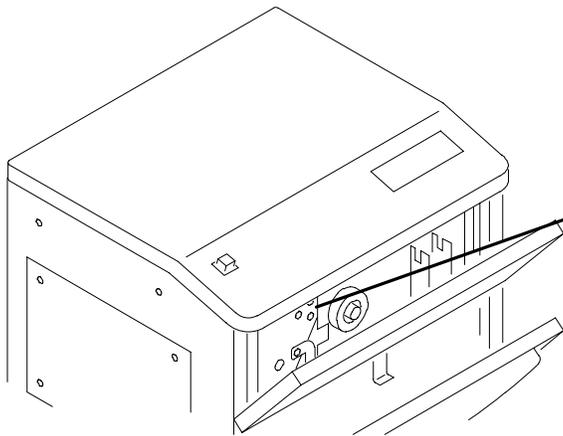
[8] Enter [I] [T] [R] to initialize the TRANSPORT ROLLER.

[9] Enter [P] [M] [R].

[10] Enter [-] [2] [8] [1] for the pulse number.

[11] Enter [4] [4] [4] for the speed.

[12] When the ROLLER hits the STOPPER, check that the ROLLER SHAFT is centered in the FRONT and REAR MECH PLATE holes and contacts the TRANSPORT ROLLERS.



H129\_5403BCA  
H129\_5403BC

**To Adjust:**

```
error=0
Enter Command: PMR

Pulse number? (-30000 to 30000) [0]: -10
Speed? (10 to 1500 pps) [10]: 10
```

[13] Enter [P] [M] [R].

[14] Enter a [-] pulse number to move the ROLLER toward the STOPPER and a [+] pulse number to move the roller away from the STOPPER.

[15] Enter [1] [0] for the speed.

**Note**

The STOPPER may need to be loosened to allow the ROLLER SHAFT to reach the correct position.

[16] Repeat Steps 13 - 15 until the ROLLER SHAFT lines up with the holes in the FRONT and REAR MECH PLATES and contacts the TRANSPORT ROLLER.

[17] Loosen the 2 SCREWS.

[18] Move the STOPPER until it is against the ROLLER SHAFT.

[19] Tighten the 2 SCREWS.

[20] Go to Step 18 on Page 5-100 to check the RECEIVE ROLLER POSITION SENSOR.

## CHT1 Supply Roller Position Sensor

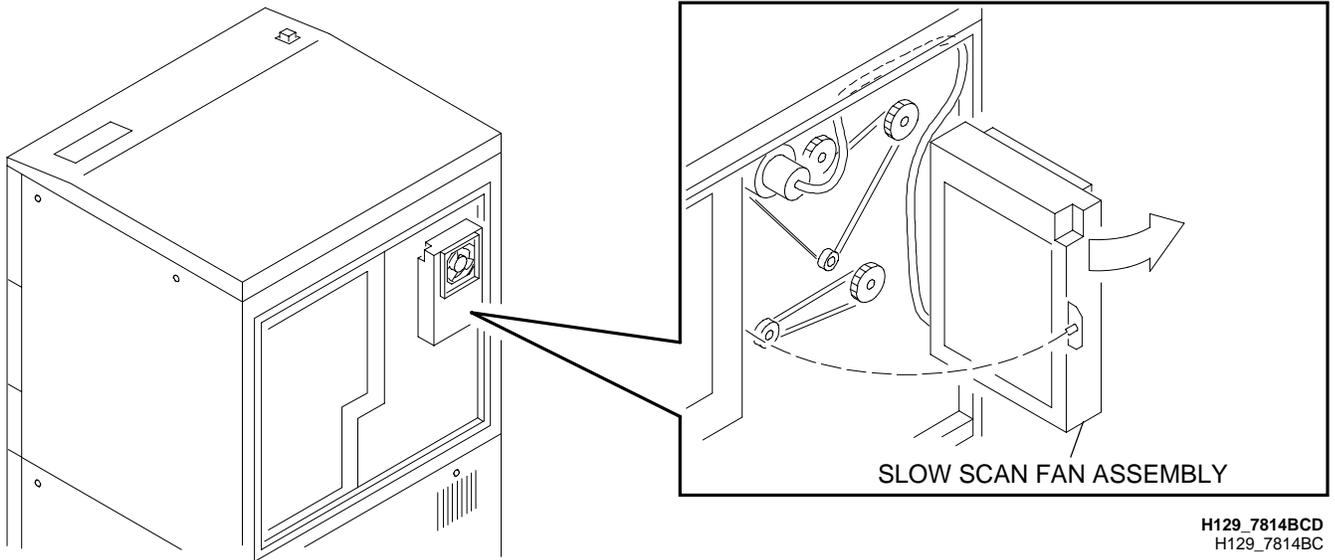
### Note

Do this procedure when:

- replacing the SUPPLY ROLLER ASSEMBLY
- replacing the SUPPLY ROLLER POSITION SENSOR
- experiencing transportation film jams.

### To Check:

- [1] Install the PORTABLE COMPUTER. See “Using the Portable Computer” in the Diagnostic Section.
- [2] Open the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3
- [3] Open the SLOW SCAN FAN ASSEMBLY.



- [4] Energize the LASER PRINTER.

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit
Enter Menu Item:
    
```

- [5] Use the PORTABLE COMPUTER to display the CES Main Menu.

```

MONITOR MODE MENU
1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test
Enter Menu Item:
    
```

- [6] Enter [1] for “Monitor Mode”.

Input 'HLP' to know commands.

Enter command:

Enter Command: ITR  
error=0

error=0  
Enter Command: PMS  
Pulse number? (-30000 to 30000) [0]: 14  
Speed? (10 to 1500 pps) [10]: 10

Enter Command: PMS  
How many pulses? (-30000 - 30000):

How many pulses? (-30000 - 30000): -64  
Speed? (10 - 1500 pps):

Speed? (10 - 1500 pps): 300  
error=0  
Enter command:

Enter Command: PMS  
How many pulses? (-30000 - 30000):

How many pulses? (-30000 - 30000): -10  
Speed? (10 - 1500 pps):

Speed? (10 - 1500 pps): 10  
error=0  
Enter command:

[7] Enter [7] for "Enter Commands".

 **Note**

- Commands must be entered using capital letters.
- See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.

[8] Enter [I] [T] [R] to initialize the roller.

[9] Enter [P] [M] [S].

[10] Enter [1] [4] for the pulse number.

[11] Enter [1] [0] for the speed.

[12] Check that the SUPPLY ROLLER is resting against the STOP BRACKET and in contact with the TRANSPORT ROLLERS. If the SUPPLY ROLLER is not in the correct position, go to Step 21.

 **Note**

The following steps allow the SUPPLY ROLLER STEPPER MOTOR to be rotated in incremental steps equal to the number of pulses entered. The number of pulses entered will depend on how far away the edge of the flag is from the sensor. The flag should activate the sensor within 10 pulses after the initial -64 pulses are entered.

[13] Enter [P] [M] [S] to start the SUPPLY ROLLER MOTOR.

[14] Enter [-] [6] [4] for the number of pulses.

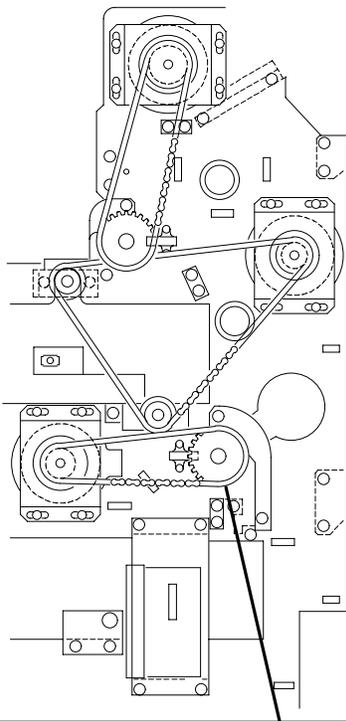
[15] Enter [3] [0] [0] for the speed.

[16] Check that the LED indicator on the underside of the SUPPLY ROLLER POSITION SENSOR is on. If the LED indicator is off, go to Step 21.

[17] Enter [P] [M] [S] to start the SUPPLY ROLLER MOTOR.

[18] Enter [-] [1] [0] for the number of pulses.

[19] Enter [1] [0] for the speed.



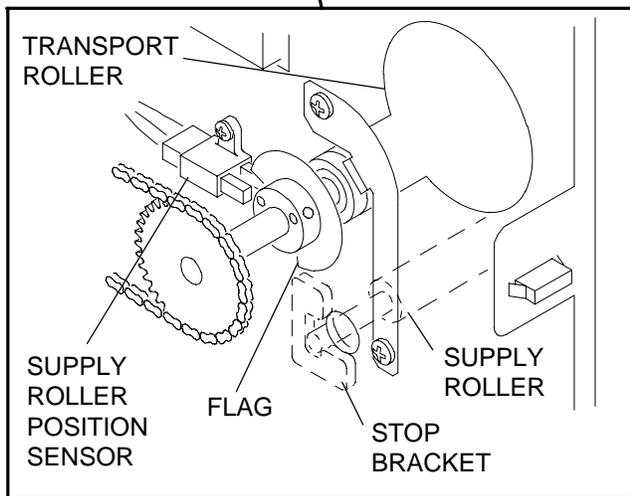
[20] Check that the LED indicator on the underside of the SUPPLY ROLLER POSITION SENSOR is off.

**Note**

If the LED indicator is off after the previous step, STOP, this procedure has been completed.

[21] Press the [ESC] key on the PORTABLE COMPUTER 2 times to return to the MAIN MENU.

[22] Manually, align the SUPPLY ROLLER shaft so that the SUPPLY ROLLER rests against the STOP BRACKET and TRANSPORT ROLLERS. The ROLLER will remain in place.



H129\_4201CCB  
H129\_4201CC

```

MONITOR MODE MENU

1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test

Enter Menu Item:
    
```

[23] Enter [1] for "Monitor Mode".

```

Input 'HLP' to know commands.

Enter command:
    
```

[24] Enter [7] for "Enter Commands".

```
error=0
Enter Command: PMS

Pulse number? (-30000 to 30000) [0]: -64
Speed? (10 to 1500 pps) [10]: 300
```

```
Enter Command: PMS
How many pulses? (-30000 - 30000):
```

```
How many pulses? (-30000 - 30000): -10
Speed? (10 - 1500 pps):
```

```
Speed? (10 - 1500 pps): 10
error=0
Enter command:
```

- [25] Enter [P] [M] [S].
- [26] Enter [-] [6] [4] for the pulse number.
- [27] Enter [3] [0] [0] for the speed.
- [28] Loosen the 2 SET SCREWS on the SUPPLY ROLLER POSITION SENSOR FLAG.

 **Note**

The LED indicator on the underside of the sensor is on when the sensor is not blocked, and off when the sensor is blocked. The flag should be set at the point just before the LED indicator goes off. The LED indicator should be on.

- [29] Rotate the FLAG counterclockwise so that the flag edge is located where it just blocks the sensor beam.
- [30] Check the LED indicator on the underside of the sensor and rotate the flag clockwise to the position just after the LED goes on.
- [31] Carefully tighten the 2 SET SCREWS.
- [32] Enter [P] [M] [S] to start the SUPPLY ROLLER MOTOR.
- [33] Enter [-] [1] [0] for the number of pulses.
- [34] Enter [1] [0] for the speed.
- [35] Check that the LED indicator on the underside of the SUPPLY ROLLER POSITION SENSOR is off. If the LED indicator is off, go to Step 8. If the LED indicator is on, go to Step 21.

## CHT2 Receive Roller Position Sensor

### Note

Do this procedure when:

- replacing the RECEIVE ROLLER ASSEMBLY
- replacing the RECEIVE ROLLER POSITION SENSOR
- experiencing transportation film jams.

```

MAIN MENU
1 Monitor Mode      4 System Params
2 System Logs      5 Debug Utility
3 Boards Diag      6 Exit
Enter Menu Item:

```

```

MONITOR MODE MENU
1 Motors           6 Seq Board Diag
2 Solenoids        7 Enter Commands
3 Relay            8 Set Beam-Splitter
4 Miscellaneous    9 Auto Sensor Test
5 Sensors          10 Semi-Auto Sensor Test
Enter Menu Item:

```

```

Input 'HLP' to know commands.
Enter command:

```

```

Enter Command: ITR
error=0

```

### To Check:

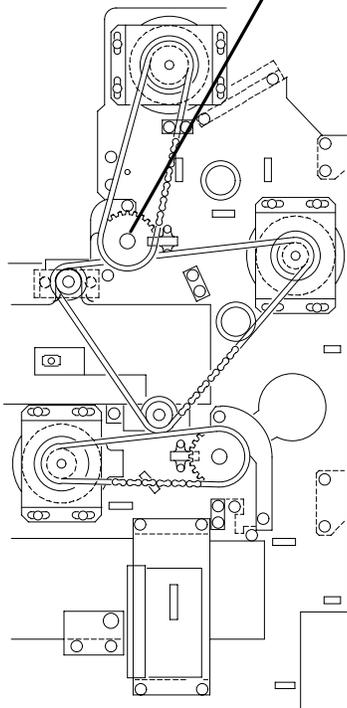
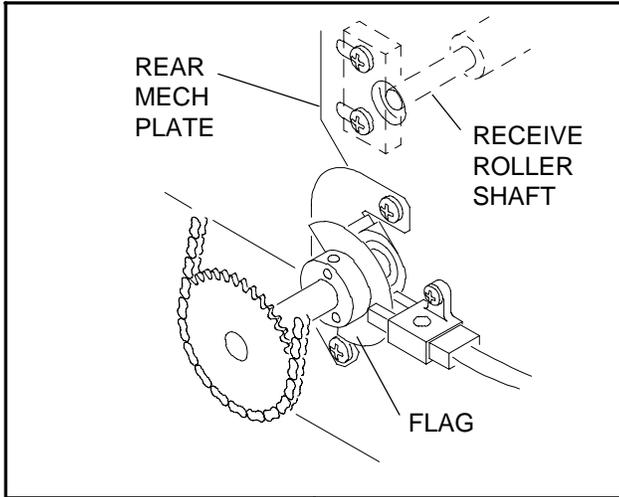
- [1] Energize the LASER PRINTER.
- [2] Install the PORTABLE COMPUTER. See “Using the Portable Computer” in the Diagnostic Section.
- [3] Use the PORTABLE COMPUTER to display the CES Main Menu.
- [4] Enter [1] for “Monitor Mode”.
- [5] Enter [7] for “Enter Commands”.
- [6] Open the BACK IMAGE UNIT COVER. If necessary, see the procedure on Page 2–3.
- [7] Open the SLOW SCAN FAN ASSEMBLY DOOR.

### Note

- Commands must be entered using capital letters.
  - See the Diagnostics section to clear any error messages displayed on the PORTABLE COMPUTER during this procedure.
- [8] Enter [I] [T] [R] to initialize the ROLLER.

```
error=0
Enter Command: PMR

Pulse number? (-30000 to 30000) [0]: -281
Speed? (10 to 1500 pps) [10]: 444
```



H129\_4200CCB  
H129\_4200CC

[9] Enter [P] [M] [R].

[10] Enter [-] [2] [8] [1] for the pulse number.

[11] Enter [4] [4] [4] for the speed.

[12] Check that the ROLLER SHAFT lines up with the holes in the FRONT AND REAR MECH PLATES and contacts the RECEIVE TRANSPORT ROLLERS.



**Important**

If the ROLLER SHAFT is not in position, continue with the next step. If the ROLLER SHAFT is in position, go to Step 17.

```
error=0
Enter Command: PMR

Pulse number? (-30000 to 30000) [0]: -10
Speed? (10 to 1500 pps) [10]: 10
```

**[13]** Enter [P] [M] [R].

 **Note**

The number of pulses entered depends on the distance the ROLLER SHAFT must be moved.

**[14]** Enter a negative pulse number to move the ROLLER toward the STOPPER and a positive pulse number to move the roller away from the STOPPER.

**[15]** Enter [1] [0] for the speed.

**[16]** Repeat Steps 13 - 15 until the ROLLER SHAFT lines up with the holes in the FRONT and REAR MECH PLATES and contacts the TRANSPORT ROLLER.

```
error=0
Enter Command: PMR

Pulse number? (-30000 to 30000) [0]: 562
Speed? (10 to 1500 pps) [10]: 444
```

```
error=0
Enter Command: PMR

Pulse number? (-30000 to 30000) [0]: 5
Speed? (10 to 1500 pps) [10]: 10
```

- [17] Check that the RECEIVE ROLLER is resting against the STOP BRACKET.



**Important**

If the RECEIVE ROLLER is in position continue with the next step. If the RECEIVE ROLLER is not in position do the Receive Side Stopper Adjustment procedure beginning at Step 13 on Page 5–92.

- [18] Enter [P] [M] [R] to start the ROLLER MOTOR.
- [19] Enter [5] [6] [2] for the pulse number.
- [20] Enter [4] [4] [4] for the speed.
- [21] Check that the LED INDICATOR on the SENSOR is off.



**Important**

If the LED INDICATOR is on, go to Step 26.

- [22] Enter [P] [M] [R] to start the ROLLER MOTOR.
- [23] Enter [5] for the pulse number.
- [24] Enter [1] [0] for the speed.
- [25] Check to see that the LED INDICATOR on the SENSOR is on. If it is on, **STOP**, this adjustment is completed. If it is off, go to Step 30.
- [26] Loosen the 2 SETSCREWS.
- [27] Rotate the FLAG counterclockwise until the LED INDICATOR on the SENSOR just turns off.
- [28] Carefully tighten the 2 SETSCREWS.
- [29] Go to Step 8 to repeat the check procedure.
- [30] Loosen the 2 SETSCREWS.
- [31] Rotate the FLAG clockwise until the LED INDICATOR on the SENSOR just turns on.
- [32] Carefully tighten the 2 SETSCREWS.
- [33] Go to Step 8 to repeat the check procedure.

---

## Section 6: Preventive Maintenance Checklist

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- Read the Error History and Error Frequency Logs. Look for trends and possible problems. Clear both logs.
- Print test patterns. Compare to test patterns made at installation. Check for artifacts.

**Caution**

Do not touch the POLYGON MIRROR surface.

- If artifacts show on the film, clean the OUTPUT MIRROR and LENSES with Spectro•Grade Acetone, Part No. 1C8068 and LENS PAPER TL-2278.
- If necessary, calibrate the LASER PRINTER using the procedure on Page 4–2.
- Use a soft cloth to clean the surfaces of the 2 film SUCKERS.
- Use alcohol to clean the following rollers:
  - UPPER TRANSPORT ROLLER
  - LOWER TRANSPORT ROLLER
  - RECEIVE ROLLER
  - SUPPLY ROLLER
  - PINCH ROLLER.
- Clean or replace the following filters:
  - IMAGING UNIT INTAKE FAN FILTER, located under the SUPPLY MAGAZINE.
  - CARD RACK INTAKE FILTER
  - FRONT COVER FILTER
- Clean the SLOW SCAN MOTOR FAN COVER.

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